

RECORD



F. R. Fosberg  
Field notebooks

Collection and Field Note Book

No. 68

(Oct. 14, 1962 - Jan. 25, 1963)

(1962-1963)

1-2	.....	Colombia (from air)
3-4	.....	Colombia (from air)
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89-90	.....	Colombia (from air)
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95-96	.....	Colombia (from air)
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Specimens collected (28-82)

(65-73) (65-73)

(65-73) (65-73)

(65-73) (65-73)

(65-73) (65-73)



Collection and Field Note Book

No. 66

(Oct. 14, 1962 - Jan. 25, 1963)

(43245 ----- 43403)

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Field notebook  
# 66

Those plants collected by Dr. Fosberg at "Alta da Serra" have the following data: Brazil, State of São Paulo, Município de Riberão Pires, nature reserve of "Alto da Serra", about 1/2 to 1 km west of city of PARANAPIACABA. Subtropical, montane low rainforest or scrub.

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Those plants collected in the cerrado at Emas...the following data; Brazil, State of São Paulo, Município de Piracicaba, Emas. Cerrado vegetation, open to semi-closed scrub or scrub forest. 27 Oct. 1962.

p. 64

→ to 43327

George Eiten

p. 64 on

all labels done & proofread.



F. R. Fosberg

Field notebooks

# 66

begin 43245

end 43403



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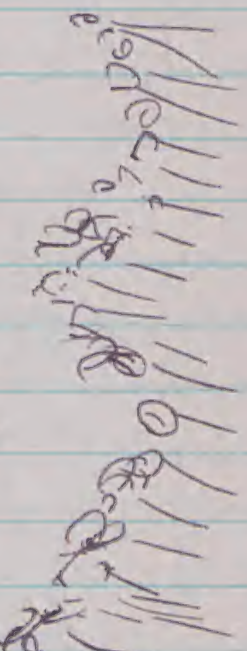
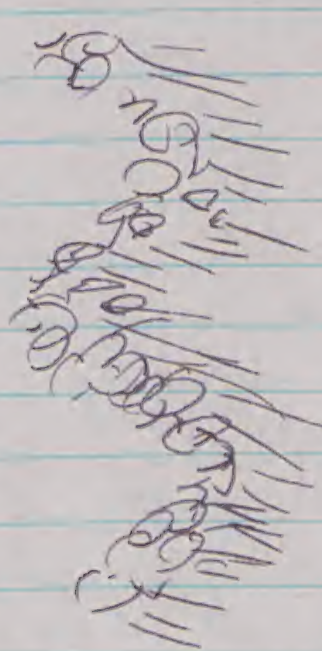
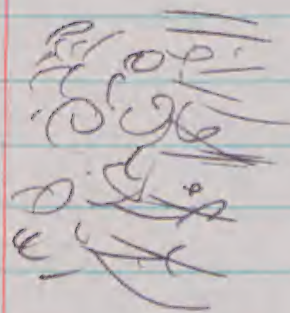
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A front is apparently a real thing - two parallel sinuous ~~bands~~ <sup>some</sup> of cloud ~~several~~ miles apart perhaps a mile wide, the north side lower, sloping evenly downward from a lumpy cumulus on south to a smooth wispy strato-cumulus or stratus to north, this simply fading out.



ground wind  
e.n.e.  
at Monty.  
ca. u.s.w.

Another broken piece of similar cloud farther south.

Must be either from a north wind sliding up over an air mass or a south wind pushing in under one - probably the former 11:05 a. bet. at. Mt.



1962

no. of mob. in sparsely settled area, generally forested are some broad thinly vegetated sand-hills(?) or elevated sand flats. Into them, from north, and somewhat also from south, are what look like systems of tidal channels, filled with woods.

photos of Alacran, Progreso coast, ~~at~~ sisal plantation s. of Merida - a patchwork of sisal patches, abandoned sisal patches, scrub and scrub forest. Beyond the main plantation area, a few miles south the large scrub open scrub forest, and scrub forest areas are spotted with small clearings. The scrub and forest are a patchwork of regrowth of various ages. Broad strips of sisal plantation extend south along highways and are scattered along a new road running transverse to course.

South of this cultivated patches are abundant - active and just abandoned ones occupying perhaps 10-20% of area, as far as first range of low hills. South of this there are some patches and locally plenty of regrown abandoned ones, but mainly forest over large areas, even along the road parallel to course on left. Some ~~part~~ areas are quite heavily cleared south of hills. Also some local savanna areas, with irregular mosaic of wooded patches and grass. Area n.w. of ~~Ticul~~ Ticul is rather heavily cleared for shifting agriculture, less so but still heavily southwest around Santa Elena. Beyond this large areas of fair forest with only faint angular patterns alternating with areas that are mostly cleared, irregular patches of savanna, then mostly unbroken forest with no visible evidence



that it ever has been cleared.

This is mostly flat, but locally gently hilly.

20 min. out

Then a new road transverse to course - prob Bolonchenticul rd. but no clearings along it. South of this several minutes several faint traces wandering eastward through the dense forest, and one southward along course to several clearings perhaps Sahcabchen - but as far as visibility extends to east, generally solid forest.

Several open patches, irregular, only one of them shows any indication of buildings, no cultivation. Several seem marshy but most just brownish green grass, southward these tiny spots become fairly common. Some black small ponds (cenotes?), and some marshes or swamps with ponds in them. One tiny clearing with a building.

But mostly forest no more opening, then a black stream

with some swamp south of it across course, a meandering tributary enters from south along course. Then several ~~flat~~ medium savanna areas in forest, with ponds and a large muddy lake. ~~then~~ then forest, then a patch of savanna of large size somewhat to left, surrounded by forest, low karstlike hills nearer course densely forested, then flat forest and a savanna patch along course, then a muddy river across course with a black winding lake south of it, a village on it to left, and a large swamp south of this, south of it a black lake of some size. then vast forest, a small meandering stream with meadow or marsh along it, a clearing on it with a road leading to it from south, otherwise forest. Then a wrinkled bit of karst and on course a large meandering muddy river more karst patches, then a mountain front with karst behind it, all densely forested.



45 min  
out

Some faint streams.  
 Extreme heat, ~~as~~ with  
 flat ground between,  
 hills forested, flat ground  
 meadow. Then a stream  
 gorge. More heat and  
 green grassy meadows.  
 Scattered tiny houses.  
 A small cultivated valley,  
 then a deep canyon  
 across course with a  
 muddy stream in it.  
 Then dissected country,  
 no longer limestone -  
 45° slopes partially  
 wooded, ridges tending  
 to be grassy, relief high,  
 very mountainous, ~~some~~  
 more and more denuded.  
 Then cleared patchwork  
 hills very much ~~so~~  
 cultivated except steeper  
 parts, brownish green.  
 Then semi-cleared,  
 semi wooded very  
 dissected country, locally  
 densely settled, locally  
 not, but becoming  
 more and more cleared  
 and denuded southward.  
 Some forested areas.  
 Locally 75% wooded, locally  
 10%. Varying. Streams  
 in canyons become red muddy.

Country generally cleared  
 grassy or scrubby, only a  
 few patches of forest. Quite  
 a few roads on ridges.  
 Approaching Guatemala City,  
 sharply dissected plateau,  
 intricate canyons with  
 very steep sides, flat-topped  
 or sharp ridges, mostly  
 wooded sides, tops cultivated.  
 This north of Guatemala  
 City. The city is on this  
 plateau but less dissected.  
 Guat. to San Salvador.

South of Guatemala City,  
 around Lake Amatitlan  
 flat topped hills,  
 slopes mostly wooded,  
 some cleared, flat tops  
 cleared and cultivated.

Visibility very poor.

Rolling country south  
 partly wooded, partly  
 cleared, another part  
 cleared, rougher parts  
 wooded. Mountains to  
 right of course mostly  
 mostly wooded, to left  
 cleared to tops.

Dissected country to right,  
 mostly cleared. All cleared  
 ground s. of Guat. City bright  
 green. More gently rolling  
 cleared country, ravines wooded.



1964 Guatemala -

Relief gets lower but dissection more intricate. Ravines still wooded. Visibility very poor.

After a few minutes, a mountainous region with long ravines converging backward along course, mostly cleared. Higher peaks ahead in clouds. Some parts apparently cultivated, hedges between patches, mostly pasture with some scattered bushes. Bottoms of ravines wooded.

Then no visibility. A sharp mostly wooded peak sticking up out of the clouds, a few clearings on slopes.

Then a cluster of wooded mountains to left, a plain, mostly open, to right. A city (Santa Ana?) at base of mountains. Course turns left, along a broad flat valley, mostly cleared. Hedgerows between fields - fields green. Then broad flat valley laid out in squares - doubtless sugar

cane, but if so, mostly harvested. Many fields brownish green.

Railroad crosses the lake just beyond it.

Ravine in plain with gallery. Course turns left to meet a high mountain, wooded on upper slopes. A broad black lava flow on sides. Beyond this a densely wooded slope. A high cone on end of this range. Beyond it basin with San Salvador.

The area just before the lava flow ~~is~~ is green, grassy, possibly a flow that is not yet wooded, but possibly also cleared.

Considerable forest locally around San Salvador.

Area around airport a deeply dissected plateau, ravines are wooded gorges.

Plants at airport -

*Dolichos lablab*

*Hibiscus hybridus*

*Codiaeum variegatum*

*Stenotaphrum secundatum*

*Alternanthera versicolor*

*Chrysolidocarpus lutescens*



J. Salvador - Managua  
E. of San Salvador, around  
lake, flat ground is  
cultivated, steep slopes  
partly wooded, partly  
grassy. Slopes ~~are~~ go  
steeply down to lake.

Eastward relief is  
not great but there  
is dissection. Ravines  
are wooded, flatter ground  
cultivated.

Coastal plain largely  
clear, large fields separated  
by hedge rows, more  
inland the fields are  
smaller.

Plain of Rio Lerma almost  
all cleared and in plantation  
prob. sugar cane.

Complex area of swamps  
and lagoons east of Rio Lerma,  
sugar plantations inland  
and along coastal strip  
where it is wide enough.  
Swamp gets narrower  
eastward toward mouth.

Visibility very poor.

Managua Airport - plants  
*Codiaeum variegatum*  
*Pseuderanthemum carnathanii*  
*Rauwolfia inermis*

Oct. 14  
San Jose -

*Euphorbia cotinifolia* red form  
(*E. coccinea*)

*Cyperus papyrus*

*Polygodium aureum*

*Euphorbia pulcherrima*

*Spathodea campanulata*

*Nephrolepis exaltata*

*Felicea purpurea*

*Cosmos sulphurea*

*Alpinia purpurata*

*Agave americana*

*Acalypha hispida*

*Malvaviscus arboreus*

*Cordyline ~~benzoina~~ <sup>distachya</sup>*

*Anacardium occidentale*

*Bidens leucantha*

*Euphorbia leucophylla*

This season has been  
very rainy - rain every  
afternoon. Oct. + Nov.  
said to be rainiest period.

*Gladiolus*

*Oreanthus caryophyllus*

*Delonix regia*

*Albizia ~~maxima~~*

*Lobularia maritima*

*Euphorbia bojeri* (= *mili*)

*Plumbago auriculata*

*Drymaria cordata*

*Axonopus compressus*



*Thuja orientalis*  
*Begonia nivalis*  
*Vietchia meunillii*  
*Crocentis alyce*  
*Yucca elephantipes?*  
*Euphorbia tirucalli*  
*Kalanchoe verticillata*  
*Euphorbia spathulata* (?) <sup>statute</sup>  
*Blechnum pyramidatum*  
*Kalanchoe pinnata*  
*Lantana camara*  
*Femur callis fulva*  
*Blechnum occidentale*  
*Cereus undatus*  
*Pilea microphylla*  
*Apium* ~~leptophyllum~~  
*Caladium bicolor*  
*Xanthosoma sagittifolia*  
*Synedrella nodiflora*  
*Nephrolepis cordifolia*  
*Pistia stratiotes*  
*Eichhornia crassipes*  
*Theretic peruviana*  
*Ficus elastica*  
*Eriobotrya japonica*  
*Asparagus plumosus*  
*Carludovica palmata*  
*Vernonia*  
*Caesalpinia pulcherrima*  
*Casimiroa edulis*  
*Monstera deliciosa*  
*Persea americana*  
*Saccharum officinarum*

*Gliricidia sepium*  
*Spondias mombin*  
*Psidium guajava*  
*Beloperone guttata*  
*Philadelphus* (large fl.)  
*Acalypha wilkesiana*  
*Cyperus alternifolius*  
*Schiuma molle*  
*Nerium oleander*  
*Hibiscus schizopetalus*  
*Musa sapientum*  
*Codiaeum variegatum*  
*Grevillea robusta*  
*Coffea arabica*  
*Colocasia esculenta*  
*Carica papaya*  
*Carica candamarcensis*  
*Oenothera* (Raimondii) cf. *stricta*  
*Pilea microphylla*  
*Bauhinia* cf. *purpurea*  
 (5 stamens)  
*Cassia alata*  
*Chrysanthemum pyrenaicum*  
*Impatiens sultana*  
*Polyscias fruticosa*  
*Chenopodium ambrosioides*  
*Apium leptophyllum*  
*Solanum nigrum*  
*Lepidium virginicum*  
*Verbena* ~~officinalis~~ <sup>littoralis</sup>  
*Plantago major*  
*Euphorbia hirta*  
*Caltha* (hollyhock)  
*Hedera helix*

*Danseria guianensis*  
*Strobilites africanus*  
*Leindolpus aureus*  
*Antigonon leptopus*



Sept. 15 - trip by auto from San Jose to Turrialba

Out of San Jose -  
Coffee plantations,  
trimmed to about 1.5 - 2 m.  
shaded by scattered  
Erythrina, Inga, and,  
locally, bananas.  
The Erythrina trimmed  
down to approximate the  
habit of the Inga.

The canopy varies from  
almost complete but thin  
to perhaps as little as  
15%. Clumps of taller trees  
around houses. Cupressus, Camaria etc.

### Tres Rios

Mts. have patches of  
forest and patches of bright  
green grass. The forest mostly  
in ravine heads and on  
steep slopes. Many patches  
of sparse to dense brush.

Climbing up from Tres  
Rios road enters a plateau  
of rolling hills, grassy  
except for small moist  
patches, wooded ravine  
bottoms, and hedgerows  
separating fields. These  
are very conspicuous.  
Banana patches and small

Plants seen on road  
not already seen in San Jose

Oxalis variabilis  
Tibouchina semidecandra  
Impatiens balsamina  
Zea mays  
Ricinus communis  
Agave cf. sisalana  
Cosmos tinctoria  
Napaea cochenillifera  
Nerium indicum  
Falvia splendens  
Pelargonium zonale  
Duranta when  
Duranta sp. (large fl.)  
Ipomoea herbsteri  
Pennisetum purpureum  
Melinis minutiflora  
Stachytarpheta (large, purple fl.)  
Catharanthus roseus  
Pteridium aquilinum  
Boerhaavia frutescens  
Asclepias curassavica  
Mimosa pudica  
Miscanthus sinensis ? ? ?  
(det. Cervantes & Juan Vinas)  
Eugenia jambos  
Casia alata  
Ochroma pyramidalis  
Hippobroma longiflora  
Tibouia diversifolia  
Alocasia macrura ?  
Terminalia catappa  
Celosia argentea

cult.



coffee plantations in low places. Hedgerows are very conspicuous - of *Erythrina*, *gloriosa* both pollarded, many other plants.

Beyond Cartago more or less same. Mt slopes to left a patchwork of cultivation, patches bounded by hedgerows.

In distance to rt. partially wooded mts.

Several miles out an area of sugar cane patches.

### Paraiso

Rolling plateau with pasture, maize, cane, patches. Some coffee. *Salix chilensis*, cypresses, *Erythrina*, *Crataegus*, large *Yucca* clumps & hedge rows.

Mt. range to rt. largely wooded on higher slopes & ridges, largely cleared on lower slopes.

Well beyond Paraiso considerable cane, also considerable rocky land.

this in pasture but locally with many scattered trees. Patches of second growth, scrub forest and forest. coffee sugar cane on the best sites.

Arwantes.

More and more cane. except on steeper slope.

Lava and volcanic breccia exposed in all road cuts.

Country gets rougher.

Bananas on steep slopes, cane on gentle ones.

Then less rough - rolling terraces, predominantly cane. Bananas on rising sides - where too steep, secondary scrub.

Km 28 Hedges less notable here, but spread of *Euphorbia cotinifolia* (purple).

Juan ~~Villas~~ Viñas

Less cane, more pasture, coffee & bananas.

Some open secondary scrub forest, varying & pasture with scattered trees - some guano.

Mts. to left a matrix of wood & grass. Lower



slopes coffee.

Descending toward  
Turmalba coffee becomes  
predominant.

Plants seen in Turmalba

*Emilia javanica*

*Tabernaemontana divaricata*

*Gesneria cordifolia*

*Allamanda cathartica*

*Ravenala madagascariensis*

*Artocarpus altilis*

*Artocarpus heterophyllus*

*Hevea brasiliensis*

~~See map~~

*Cassia spectabilis*

*Caesalpinia pulcherrima*

Carthage

*Cycas revoluta*

*Cyphorhynchus*

*Casuarina stricta*

~~See map~~

Oct 14 - Auto trip, Turmalba -  
Cerro del Monte Irazu

Volcan Turmalba - view  
Slopes wooded, lower  
slopes cleared. Considerable  
area on summit is open.  
Burdowski says mainly  
covered by *Vaccinium*.

Hedges of *Bromelia*, *Stachytarpheta*, *Euphorbia corollata*,  
*Erythrina berteriana*.

*Alnus juncellensis*  
along ravine said to be  
planted to improve  
pasture - fixes N.

Large trees left after  
clearing are *Alnus* or  
*Caryopteris mexicana*.

*Cupressus lusitana*

Slopes of Irazu - patch  
woods of fields separated  
by hedgerows of *Erythrina*,  
*Acnistus arborescens*, various  
melastomaceae, *Cedrela*  
*indurata*, *Pinus*, *Cupressus*.

2400 m. Montane forest in ravine  
of *Quercus*, *Alnus*, *Monina*,  
*Oreopanax*, *Drimys*, *Saurauya*.



photos  
Dendropanax, Croton  
Cornus disciflora. Fuchsia arb.  
trees characteristically  
with compact rounded  
crowns

Upward Alnus, junipers,  
and Buddleia become  
abundant in ravine,  
also scattered on slopes.

### San Juan de Cheques

More and more trees  
in pastures upward,  
mostly Buddleia alping,  
some Desfontainia, Escallonia  
Quercus forming an  
open to sparse forest.

Gunnera in wet  
ravine.

Chusquea Crotalaria  
Km 25

E. side becomes wetter.  
Very foggy.  
mainly European weeds.  
Cichora abundant.

Trees become smaller  
and closer together upward  
but still open with  
Pennisetum claudens.

Acacia along road  
outside fence.

Changes to a sparse  
scrub just below summit  
at about 3200-3300 m.

Beds of ash, cinders,  
scoria

Scrub on S. side sparse  
damaged by cattle, on  
west side closed; at head  
just below rim.

Crater is a multiple  
one with at least 4 openings  
at different levels, each  
with a lake or dry ash flat  
in bottom. Complicated pattern  
of ash beds, much erosion  
of inner slopes into numerous  
small gullies.

Very little vegetation on  
inner slopes - some Perrettia,  
Gunnera, grasses. Old trunks  
of large ~~tree~~ shrubs  
apparently killed by  
fumes.

Much steam coming from  
crater, even some coming  
from ground on rim.  
Slightly 90° or so.



Grassoid scrub  
lines inner slope  
of *Vaccinium*, *Perrettia*,  
photo *Gaultheria*, *Myrtus*,  
*Arctostaphylos*, *Myrsine*,  
*Hypericum*, *Hesperomeles*,  
etc. with *Bomarea*,  
*Acacia*, *Nertera*, *Coumar*

1846m Deep ravine with  
abundant Gunnera  
*Chusquea*, ferns *Nertera*  
epiphytic *Vaccinia*.

The pattern in  
central Costa Rica seems  
to be that the lower slopes  
of the mountains are  
cleared and either in  
grass ~~pasture~~ cultivated,  
the fields moderate  
sized, separated by hedgerows  
or "living fences." Locally  
small trees are scattered  
in the pastures. On the  
upper parts of the cleared  
slopes trees become more  
frequent, and *Alnus*  
*jauillensis* is actually  
left or encouraged, even  
planted in the pastures  
to increase fertility (roots  
are full of nodules - dense  
much branched, caused by

*Actinomyces alvi*, a  
nitrogen fixer. Scrub  
around mountain summits  
locally dense, locally opened  
up by cattle.

Hilly or rolling plateau  
land is generally cleared  
and in pasture or cultivation  
apparently depending on  
age of the lava or ash and  
consequent amount of  
leaching. The best lands  
are in sugar, bananas,  
and coffee. The poorer in  
pasture. Here again the  
fields are separated by hedgerows.

The upper slopes of  
most of the mountains  
seem to be ~~at~~ largely  
still forested.

Acc. Tosi south of the  
valley of the Reventazon  
there are enormous  
areas of uncut forest.

Coffee here is shaded,  
mostly by *Inga* or *Erythrina*.

Coffee plantations all  
the way from San Jose to  
Heredia and most of the  
way to the airport.  
Bananas commonly  
planted in with coffee



Oct. 16 - hills west of Turrialba  
in hedgerow along road

243245

Myrsine ferruginea

3 46

Casearia?

Oct. 16 - s. slope of Irazú Volc.  
in patch of open wood

7 47

Alnus jorullensis  
common

same - in <sup>deep</sup> wet ravine

3 48

Nertera granadensis  
hanging from wet cliff

1 49

Nertera granadensis  
on wet ground

4 50

Asplenium  
common on cliffs

2 51

Asplenium  
rare on cliffs

1 52

Grammitis  
rare on rock

1 53

Elaphoglossum  
occasional on rock

2 54

(fern)  
common on rock

~~same~~ same - <sup>near</sup> edge of  
deep ravine in pasture

1 55

Cuscuta?  
in grass

1 56

Pennisetum clandestinum  
forming a dense mat

6 57

Alnus jorullensis  
common in forest

1100 m.

500 m.

slender tree 5-6 m. tall  
small tree

2800 m.

medium sized tree.

2800 m.

fruit scarlet

prostrate

erect

prostrate; stamens white.

small tree; catkins pendent.



- 43258 *Quercus sapotaefolia*?  
common in forest
- 2 59 *Spiranthes*  
epiphytic on tree trunk  
in edge of forest
- 3 60 *Polypodium*  
common epiphyte
- 5 61 *Cornus disciflora*  
common
- 4 62 *Monina*  
rare in edges of forest
- 1 63 *Fuchsia*  
local in edges of forest
- 1 64 *Eryngium*  
abundant on grassy slopes
- 2 65 *Drimys winteri* var.  
common
- 1 66 *Valeriana*  
rare on earth banks  
at edges
- 2 67 *Cheilanthes hirsuta* Link det  
common on vertical  
earth walls
- 2 68 *Cystopteris diaphana* (Boyd) Blasdell det.  
occasional on vertical earth walls.
- 4 69 *Citharexylum lankesteri*  
common in forest
- 6 70 *Drymaria*  
common on ground in edge  
of forest

tree 20 m. tall.

erect; flowers greenish,  
roots tuberous, fleshy,  
forming a close mass.

Tree 20 m. tall; fruit green.

shrub 3-4 m. tall,  
flowers bright blue  
with yellow throat; ripe  
fruit black, fleshy.

shrub 1 m. tall  
branching somewhat  
distichous; flowers rose pink.  
heads blue, bracts white.

Tree 10 m. tall, flowers  
white; leaves white beneath.  
flowers white

Lellinger  
1978

leaves white beneath,  
brittle.

Lellinger, 1978

trees about 10 m. tall  
spikes pendent, flowers white.



Oct. 16 - summit of  
Irazú Volcano  
in dense ericoid scrub  
on steep ash slope  
on inner slope of outer crater rim

- 43271 *Myrsine*  
3 occasional  
3 72 *Hesperomeles*  
occasional  
2 73 *Hypericum strictum*  
rare  
2 74 *Vaccinium*  
common  
2 75 *Castilleja*  
occasional  
2 76 (fern) *Eriosorus warscewiczii* (Mett.) Lipd.  
common  
2 77 (fern) *Eriosorus warscewiczii* (Mett.) Cipel.  
common  
3 78 *Gaultheria donnel-smithii*  
common  
1 79 *Elaphoglossum conspersum* Christ det. DBL '79  
rare  
2 80 *Neckeria granadensis*  
common on ground  
between clumps of bushes  
4 81 *Hedyotis cavanum*  
common  
1 82 *Myrsine donnel-smithii* Rose  
occasional  
2 83 *Vaccinium*  
common  
4 84 *Myrtus catesbeii*  
common

3280 m.

- small tree, 5 m. tall;  
flower yellowish.  
shrub 3 m. tall,  
thorny; flowers whitish.  
flowers deep yellow.  
shrub 1 m. tall  
small tree; fruit  
immature

det. Seuberg, 1978

det. Seuberg, 1978

- shrub 1-1.5 m. tall.  
flowers red pink; fruit black.

- prostrate, fruit scarlet.

- weak shrub, semi-decumbent,  
flowers white.  
shrub, <sup>3 m. tall</sup> trunk 4 cm. thick,  
inflorescence bearing 4 times.  
shrub 1 m. tall; fruit  
immature.  
shrubs 1-2 m. tall,  
flower purplish-white; fruit black.



43285 *Arctostaphylos rubescens*  
common

2 86 *Pernettya*  
common

2 87 *Criaria*  
common

Oct. 16 - south slope of  
Irazú Volcano

4 88 *Nertera granadensis*  
abundant on road cut

Plants seen bet. San José &  
Airport (beyond Fecedio)

*Phoenix dactylifera*

*Musa ensata*

*Rapanea*  
*Blanca* ~~*Banana*~~ *Banana*

*Nicholaea rosea*

*Lambucus mexicanus*

*Panicum maximum*

*Terminalia calappa*

Oct. 17 - air trip San José - Panama City

Reventazón valley - a dissected  
ash bed - level spots generally  
in sugar cane, also many  
of gentler slopes - rougher  
parts either pasture or scrub.

South side, slopes up to  
mts. largely coffee plantations  
some pastures.

shrub 2 m. tall; flowers  
~~cream~~ cream white,  
maroon at orifice; fruit  
black, rugose.

— compact shrub 0.5 m.  
tall; flowers white.

— scandent shrub,  
branching distichous,  
racemes maroon.

3000 m.

forming a dense mat;  
flowers yellowish, fruit  
scarlet, soft, juicy.

Considerable ~~for~~ cloudiness,  
then a short stretch of  
visibility - a river, winding  
~~meandering~~ transverse to  
course but in a canyon.  
About 3/4 or 2/3 grass, rest  
forest in hilly country.  
Fourth east of this solid  
forest in mts.

Panama is green at this season.  
On Pacific side the shore is  
muddy, a lot of mangrove  
opposite airport.



Oct. 17 - Airport to Trout N.  
Plants seen:

*Gracilaria exilis*  
*Terminalia catappa*  
*Coccoloba nucifera*  
*Cassipourea equisetifolia*  
*Vetiveria zizanioides*  
*Pennisetum purpureum*  
*Quararuba ulmifolia*  
*Musa sapientum*  
*Panicum maximum*  
*Gleichenia repens*  
*Saccharum officinarum*  
*Antocarpus altilis*  
*Cassia javanica* a nodosa  
*Anacardium occidentale*  
*Codyline terminalis*  
*Mangifera indica*  
*Acalypha wilkesiana*  
*Canna palapa*  
*Aloesia macrochiza*  
*Hibiscus rosa-sinensis*  
*Codiaeum variegatum*  
*Caryota urens*  
*Tectona grandis*  
*Roystonia olivacea*  
*Euphorbia pulcherrima*  
*Canna hybrids*  
*Hibiscus hybrids*  
*Plumeria rubra*  
*Roystonia regia*  
*Ficus microcarpa*  
*Caladium bicolor*  
*Cyperus deventer*

*Merium indicum*  
*Alpinia purpurata*  
*Dieffenbachia (spotted)*  
*Chrysalydodactylus lutescens*  
*Scindapsus aureus*  
*Cyperus cirinalis*  
*Plumeria obtusa*  
*Sclerocarya peruviana*  
*Calophyllum inophyllum*  
*Ricinus communis*  
*Rhoeo spathacea*  
*Cassia spectabilis*  
*Russelia equisetiformis*  
*Carludovica palmata*  
*Peltophorum ferrugineum*  
*Alpinia nutans*  
*Catharanthus roseus*  
*Polypodium guilfoylei*  
*Muramba paniculata*  
*Livistona chinensis*  
*Ilex (moss with large lvs.)*  
*Ipomoea fistulosa*  
*Sansevieria guineensis*  
*Eleusine indica*  
*Phorbolus africanus*  
*Delonix regia*  
*Ravenala madagascariensis*  
*Caesalpinia pulcherrima*  
*Quisqualis indica*  
*Indica sabartena*  
*Bougainvillea spectabilis?*  
*Euphorbia spathulata*  
*Brathodes campanulata*  
*Dracaena draco?*

*Polypodium guilfoylei*  
*Sansevieria guineensis*  
*Andropogon glomeratus*  
*Acalypha hybrids*



Oct. 18 - Panama to Bogotá  
via Medellín by Constellation  
at night

2:17 Took off - out over Pacific, followed  
coast but well out.

2:31 Very complicated ~~coastline~~  
coastline with many  
short sandy beaches.  
Vegetation a patchwork of  
shifting agriculture. A large  
island well out from coast,  
many tiny ones between rocks.  
Some small muddy estuaries,  
or sandy, perhaps. No reefs.

Pearl  
Islands

2:36 Small airstrip on end of a  
hooked peninsula which points  
southeast.

2:37 over water again.

2:50 - Occasional glimpses of  
dense forest, and of the  
coast in the distance  
to the right, through deep  
cumulus clouds.

3:05 Gradually leaving coast.  
Clouds thin out. - Forest  
below unbroken, streams  
deeply incised.

3:06 A few clearings <sup>and a cleared strip</sup>  
~~muddy~~ <sup>going</sup> that cross ~~course~~  
also along a tributary - these  
streams run east.

3:09 Then more unbroken forest  
More scattered clearings and

3:10 narrow cleared strips along  
small streams.

A lake with black water,  
surrounded by marsh, a  
course, and a meandering strip  
of green extending south from  
the lake in the forest. Then  
another larger lake, also  
surrounded by marsh.

Then a large very muddy  
meandering river (R. Atit) <sup>angling to it</sup>  
with many large black lakes to right  
of it and a whole series  
to the left of it, between  
it and a meandering river,  
tributary flowing south  
and joining it. More  
lakes to east of this  
tributary - much of country  
here seems inundated,  
mostly with black, rather  
than muddy water.

Many  
marshes

Then forest, then  
heavy clouds.

3:25

A very deep valley in rugged  
mtn. and some other deep valleys  
fanning down into it.  
The high ridges wooded,  
slopes denuded.

3:27

To south tremendous  
complicated mountain  
with many very deep  
valleys with steep cleared



sides, very little wood left - a few tiny patches on highest ridges. This mass of mts. is very extensive - culminates in a very high peak far to south - Páramo de Frontino? Ris Cauca - large, very muddy, a little sparse wood high on ~~the~~ the denuded slopes east of it. Most of the landscape grassy, with some bits of wood in the ravines.

3:30

3:33 Passed a peak that almost scraped the plane. Some woods on high ridges. Mostly grassy. Valley with long factory-like buildings.

3:34

3:35 Medellín. Hills green, with some red erosion scars. Wooded ravines. Banana patches, haciendas, on low hilly land around city. Circling in to airport. River & tributaries channelized. Citrus groves.

3:38

Landed ~~at~~

## Plants

*Euphorbia tirucalli*  
*Hibiscus schizopetalus*  
*Monstera deliciosa*  
*Cattleya trianae*  
*Euphorbia pulcherrima*

4:31

Left Medellín

Slopes to right - ~~not~~ east, partly grassy, partly brushy. bits of wood near tops. Brush more continuous near tops. New construction in Medellín seems unusually ugly from air - long shed-like row-houses.

Lower slopes on west side of valley are seriously eroded and bare, at least ~~below~~ down stream from city.

Coming out over east rim, barely brushed over the ridges.

Then hills almost entirely denuded. Flat bottoms of ravines cultivated, hills grassy or brushy.

4:40

Then a broad cultivated valley with a tightly meandering river (Rio Cauca?).

Gently sloping hilly land rising southwest mostly cultivated, to rough small mountains. Visibility poor.

5:00

Rio Magdalena - muddy.

Hills generally green.

Sweeping slopes up from Magdalena to the mountain rim of the sabanas.



Inside this rim are several <sup>grassy</sup> low ridges that are pitted with sink-holes, but do not have much the form of desert. Then a wooded range, then the flat, green cultivated Sabana.

A flooded meandering river winds southward through it. Then another.

Scattered ox-bows, some marshy, some drained by wide canals that go nowhere.

Then a channelized but winding river, not flooded.

An elongate curved lake north of El Dorado Airport.

Clumps of trees indicate farm houses. Rows are along roads. New farmhouses seem to have no trees, mostly.

2 hours in  
45 min. from  
Pima

Oct. 20 - Trip by jet - Bogotá - Lima - Rio - Sao Paulo. Right side forward.

9:45

In the southern part of the Sabana there is considerable bare ground, ~~and~~ apparently result of flooding, and many more windbreaks than in north. Hills around south end are dry and brown, rather than green, as in north. Over the rim, above Páramos green again.

Southward in Magdalena drainage, a patchwork of green and brown - the brown apparently from bare soil, result of erosion - principally on bare slopes - esp. in valley below Colombia, toward Neiva, seems to be a road now east from Colombia.

10:00 Clouds for several minutes.

Country to west of <sup>the</sup> Magdalena valley is terribly denuded, only a few high ridges still wooded.

10:03 Clouds. Ravines have secondary wood. solid for a great distance.

10:12 Inter Andean Valley? or Pasto region? <sup>inter</sup> ~~inter~~ large meandering river, so must be Pasto region and Patate V.

A green patchwork, almost entirely cultivated. Sea in distance to west, with a very large estuary - must be Tumbes.

10:17

Mountains as yet mostly very well wooded. Locally much shifting agriculture but still much forest. and good forest extending most of way to sea.

10:19

High wooded peak, extending through clouds - apparently Pichincha. Vast forest, southwest of it,



To a large meandering river.  
Broken clouds so no good  
idea of the terrain is possible.

10:24

The western Cordillera of  
Ecuador, so far as can be  
seen, has much good  
forest left, though the inner  
slope is being cut very  
rapidly.

10:25

intensely cloudy.

10:28

Mountains entirely wooded  
seen through holes in clouds.  
Some shifting agriculture,  
some forest. Southward  
considerable forest.

10:30

Clouds

10:40

Very rough country,  $\frac{2}{3}$  -  $\frac{3}{4}$   
denuded, esp. on steep slope.  
Southward more denuded,  
some hills in middle  
distance appear rather  
dry grassy.

Mostly clouds.

10:44

Mts in distance to west appear  
well wooded, much less  
so closer to course.

Generally cloudy.

10:46

Mts. mostly denuded along  
course, clouds as far as  
we can see to west.

10:49

Hill in clouds - wooded hills  
with conspicuous white trees,  
a road trending east.

10:53

Wooded hills with  
scattered clearings.  
Solid clouds.

11:03

Clouds thinning out - relief  
seems to be rather minor.  
General aspect seems to be  
dry and brown, with minor  
wooded patches and green  
areas, a large closely meandering  
river, cultivation locally,  
not at all obvious where there is.

11:07

Clouds.

11:08

Coast in distance, and a  
strong turn to left, then  
a tremendous estuary lined  
with mangroves and  
side with mangrove-lined  
channels, bare brown  
areas back of mangroves  
are very extensive. North  
of this estuary a point  
reaches far to west, estuary  
transverse to course after  
turn.

11:09

11:11

Clouds extending far to  
sea. Must have  
been mouth of Guayas.

11:19

Brown hills with green  
valleys, this extending  
some distance to right.

Mostly cloudy.

11:20

A winding road over brown  
hills. Country quite rough,  
very little wood except in ravines.



11:22

Very rough dry country,  
deep canyons.

We are far inland as hills  
can be seen far to right.

Mostly cloudy.

11:30

A valley with considerable  
settlement, surrounded by  
mostly denuded hills, brown  
with greenish ravines.

11:35

Dense clouds.

11:50

Breaks in clouds show rather  
dry hills, but with some  
scraps of woods, more in area.

11:54

Hole in clouds - shows  
upland hilly country  
draining west, with  
puna type grassland.

1:04

More puna, sloping  
westward, no woods. Very  
serious erosion on certain  
ridges. Coastal desert  
visible beyond several  
ridges in distance. Great  
gravel washer in mouth  
of valley leading down to  
coast.

Cross comes closer to  
coast. Hills are very rough  
and completely treeless.

Valley bottoms are  
cultivated as they become  
wide enough.

Some of hills are slightly  
brushy.

12:00

Trees in valleys which  
show a pattern of cult. fields  
and hedges (or ditches). Coastal  
flats very sandy. Larger river valley.  
A number of bare islets  
and a forked peninsula on  
coast.

12:01

Clouds, then another coastal  
area that is mostly sandy.  
Hills away from coast are  
brown. A few ravines  
show gallery wood, but  
most show gray streak  
in bottom that must  
be gravel.

12:03

12:04

Clouds.  
Hills approach very closely  
the coast, but a flood  
valley behind first  
range. A river valley  
leading down to it  
has a braided pattern,  
considerable vegetation  
in bottom, some cultivation.  
Fields green, hills brown.

12:05

Desert hills with  
some open scrub in  
flatter ravine beds.  
Then complex valley  
systems in desert  
hills, with pale sandy  
bottoms, major washes  
with sparse scrub.  
Visibility poor.

12:06



17:03

A very extensive system of flat sandy or gravelly washes leading toward coast, looking like rivers of sand - lower courses have some vegetation.

There do not appear to have ~~an~~ an entirely logical drainage pattern - perhaps some filling with sand.

17:09

Clouds.

17:12

Descending toward Lima - gamma is complete.

17:26

Small islands off coast completely lacking any visible vegetation.

17:30

Landed in Lima.

The city has built up practically to the edge of the sea cliffs south of airport. This cliff is a remarkably straight one - no vegetation at all.

Nearer airport are green truck farms. A braided stream with some water in its channels.

The landscape around airport is more or less dominated by trees - planted, of course, largely *Eucalyptus*, some *Falix chilensis*.

2500

Took off from Lima airport.

Fields to north green to base. Hills appear very bare. They have some darkening near tops, probably due to *Tillandsia*. Circled out over Pacific and back ~~westward~~ <sup>toward</sup> east.

Large island off coast is bare, as hills on mainland.

2503

~~crossed coast~~ <sup>but</sup> started south <sup>out</sup> along coast.

2508

Crossed the coast a bit north of Pisco - a broad beach well off Tambo de Mora. Dry looking cultivation in Pisco area. Peninsula Paracas looks completely bare, light tawny color.

2510

completely cloudy for a moment. Then country back of Pisco - some small farms, apparently struggling against the sand. The rest of this entire area south of Pisco is desert, largely sandy, no vegetation visible. Vast belts of dunes. Areas of badland oriented with horns about parallel to coast - southeast. A flat agricultural area. Visibility poor.

2524

2525

Then low desert mountains with



sandy areas between them  
clouds.

2:34 a hole in the clouds showed  
dry low hilly, very eroded  
country.

7:39 Another hole, for a night -  
brown hills.

Clouds, continuously  
passed edge of cloud  
at great altitude -

An extremely rugged  
mountain mass.

4:01 Crossed a very broad  
very sandy river  
bed transverse to course.  
General vegetation  
not at all clear,  
but probably forest.  
The altitude is  
extreme and the  
haziness such  
that details are not  
at all visible.

4:05 Another broad muddy  
a sandy river bed  
in distance, transverse  
to course, but starting  
abruptly from a very  
narrow one which  
is not even visible  
in near or middle distance.  
General terrain seems  
flat.

4:07 a couple of times but

rather abrupt mountain  
masses in middle distance.  
Crossed at an angle a  
series of low ridges, a lake (?)  
in the distance.

Altitude is great and  
haziness too great to discern  
any details.

4:35 A meandering river running  
off to a bit forward of  
transverse to course, but  
crosses course at an  
angle backward.  
Dim, but looks like  
savanna country.



1962 Brazil

Oct. 21 Sao Paulo -

Instituto de Botanica

120 acres of practically  
untouched forest to be  
preserved.Complete rather smooth  
canopy - trees small,  
up to 30 m. maximum diam dbh  
maximum.

Road to Santos -

Low hills covered with  
second growth largely  
*Tibouchina*, around  
big reservoir - this is  
a dense scrub or scrub  
forest 4-10 m.*Chusquea*, *Bumelia*,  
*Cyathia*

Some marshy areas.

Toward sea the forest  
becomes more scrubby, some  
grassy.Then on the beach-off,  
the relief is great and  
there are deep canyons cut  
in the granite, densely  
covered with a low forest -  
would be called montane  
rain forest.

Plants seen - Sao Paulo

*Eucalyptus robusta**E. saligna**Grevillea robusta**Picramnia communis**Cytisus scoparius**Ficus pumila**Acacia curatavica**Musa nana**Musa sapientum**Melinis minutiflora**Rubus rosafolius**Lambium mexicanum**Cocos nucifera**Codiaeum variegatum**Hibiscus tiliaceus**Terminalia catappa**Cycas circinalis**Delonix regia**Canica papaya**Psidium guajava**Persea americana**Chrysanthemum lutescens**Cordyline ~~lutea~~ <sup>lutea</sup>**Polystichum guilfoylei**Hemerocallis fulva**Acalypha wilkesiana**Lantana camara**Althaea**Malvaviscus arboreus**Phoenix roebelinii**Livistona chinensis**Rapanea regia**R. oleracea*



Country rock is generally granite.

At foot of range is an extensive mangrove swamp with winding channels.

On lower slopes the forest is scrubby, largely Melastomaceae. *Veronica* sp. in fruit is a ~~very~~ conspicuous component. The white papery making the trees stand out, in places even dominant. *Cecropia* common.

In mangrove swamp -  
*Acrostichum aureum*  
*Hibiscus tiliaceus*

Escarpment in front of Cerro de Mar, about 900 m. Wooded except some lower slopes which have shifting agriculture, some plantations, bananas.

Plants (ctd)

*Ravenala malagascariensis*  
*Thubergia grandiflora*  
*Colocasia esculenta*  
*Nerium oleander*

*U. indica*

*Cassia stricta*

*Chorisia speciosa*

*Dracaena fragrans*

*Ficus microcarpa*

*Kalanchoe verticillata*

*Strelitzia* (other sp.)

*Acalypha marginata*

*Archontophoenix alexandria*

*Philodendron bipinnatifidum*

*Euphorbia splendens*

*Hibiscus hybrid*

*Datura stramonium*

*Ceanothus sibiricus?*

*Musa "cochinea"*

*Plumeria rubra*

*Rhododendron* (sp.)

*Quercus elephantipes* (?)

*Tricholoma rosea*

*Plumbago auriculata*

*Salix babylonica*

*Agave sisalana*

*Heliconia longiflora* (?)

*Richardia brasiliensis*

*Tropaeolum majus*

~~Gossyp~~

*Gossypia gossypifolia* (alt)

*Cynodon dactylon*

*Cardamine hirsuta*



*Sonchus oleraceus*  
*Pteris vittata*  
*Phoenix canariensis*  
*Arecastum romanzoffianum*  
*Alpinia nutans*  
*Jacaranda acutifolia*  
*Araucaria excelsa*  
*Dahlia variabilis*  
*Nerium oleander*  
*Coffea arabica*  
*Salvia splendens*  
*Ipomoea cairica*  
*Cyperus kyllingia*  
*Tricholena rosea*  
*Tipuana tipu?* (com. str. in)  
*Cupressus sempervirens*  
*Ficus carica*  
*Lobularia maritima*  
*Xanthosoma violaceum*  
*Washingtonia filifera* (slender)  
*Pantherium hysterophorum*  
*Hibiscus syriacus*  
*Solanum lycopersicum*  
*Galinsoga parviflora*  
  
*Lotaria palmifolia*  
*Tamarindus indicus*  
*Hedychium coronarium?*  
*Lonicera japonica*  
*Prunus persica*  
*Euphorbia tirucalli*  
*Cyperus rotundus*  
*Ficus elastica*



Oct. 27 - Trip Sao Paulo - Emas

Just outside Sao Paulo toward Jundiaí an irregular mosaic of "capoeira", second-growth scrub or scrub forest - marked by Cecropia, open ~~field~~ fields, Eucalyptus forest, etc.

Around Cerrado Paragua is a little original forest, and some capoeira on rough ground.

Just beyond this, but still in hilly, Eucalyptus plantations dominate (several photos). Melinis abundant in open areas.

Weeds - *Cynodon dactylon*  
*Lambium alternissimum*  
*Melinis minutiflora*  
*Pteridium aquilinum*.

This extends for some distance with only a few small patches of "capoeira". This pattern extends to Jundiaí.

Beyond this grape and pig culture, in small farms, forming a mosaic with Eucalyptus.

Locally a clump introduced barrabos in low areas. A very few coffee plantations. Not shaded.

Country becomes ~~much~~ more open near Campinas.

On drastically eroded areas clumps of Aristida hallesii are conspicuous, and indicate extreme degradation. Not eaten by cattle. Large termite mounds. Typha marshes in low areas.

Mun. de Sumaré.

Beyond here country becomes very open. Much pasture, large fields. Rolling land. Americans.

Sugar cane. Cane. Mostly pasture. A little Eucalyptus but irregularly scattered. Bushy ravines.

A few scattered Caesalpinia eximia. More and more orange groves and Eucalyptus plantation toward Pima. Some sugar cane.

This increases until, to the left of high ground it dominates landscape. Very dark red-brown soil, from weathering of basalt. Deep. Not at all rocky. (Araras 16 km.) ~~from here~~

Some patches of fairly good secondary forest. Very. Whole area was formerly coffee.



Then large open area  
much sugar cane, some  
~~fazenda~~ ~~the~~ pasture.

Some small areas of *Aleuteria*  
*fordii*. Pasture with clumps  
and patches of *Eucalyptus*  
same

Large *Eucalyptus* plantation.  
More open country some  
range groves. Patches of  
second growth. Becoming  
stems in fences. Scattered  
*Agave* *sclerocarpa*.

Rolling land. Quite a  
few palms. Woods in  
ravines and low spots.

Some *Eucalyptus*

Poste Santa Cruz.

Appr. *Pinassumungh*.

*Croton* (tree) abundant  
locally in low areas.

Locally *Piptadenia colubrina*.

~~Rio~~ *Emilia* sp. on road

*Pinassumungh*. (Act on Cerrado)

*Mangifera indica*

*Cycas circinalis*.

Large orange groves. Bamboo  
in low areas.

Toward Cachoeira

Poor Cerrado - burned  
relatively recently. Varied  
in stature.

Cachoeira - Emas

*Ficus microcarpa* in  
streets mangos

Rio Mogiguaru. has  
many species of fish,  
some very good.

*Phyllodendron bipinnatifidum*

*Allamanda cathartica*

*Terminalia catappa*

*Citrullus vulgaris*

600 m. Campo Cerrado near  
Emas -

This area has on one  
side of road a protected  
tract belonging to the  
University, not burned  
for 15-20 years. On other  
side not protected -  
(photos of both, h.w. & krd.)

The protected part  
is an open to closed  
scrub to scrub-forest,  
general level ~~4-6~~ 4-6 m.  
but emergents to 10 m.  
generally mesophyllous  
to microphyllous,  
bark on most species  
thick and ridged,  
checked, or broken.  
A few macrophyllous  
species. Varying from



orthophyllous & sclerophyll.

Badly invaded by  
melinis, which forms  
a complete ground cover,  
up to 1 m. deep.

Soil a pinkish brown  
fine loamy sand.

Much dug up by  
armadillos.

Thick bark - *Swertia*

On other side of road  
where there has been  
burning - grass is  
lower, perhaps 0.4 m.  
shrubs ~~of~~ lower,  
distribution more open,  
varying to nearly closed,  
varying to ~~for~~ open  
scrub forest, on this  
side of road mostly  
mesophyllous.

This is more typical  
as far as aspect is concerned,  
as the

Sao Paulo (under Pt. of Brazil)

Oct. 27 - near Pirassununga  
roadside in red soil  
in cutover "campo cerrado".

43289 *Emilia javanica* (Burm.f.) Rob.

Forest near Cachoeira  
is a closed forest  
about 10-20 m tall  
with a few trees  
up to 4-5 dm dbh, which  
are emergent, other 1-2 dm  
dbh 2-3 m, spaced,  
some small saplings  
between them. an <sup>open</sup> shrub  
layer 1.5-2 m tall.

not from *Emilia*

no ~~1964~~ 1962

coll. by *Emilia*

locality in *Emilia*

coll. by *Emilia*

*Emilia*

but not cleared.

Mun. Pirassununga

flowers red.



Byrsonima

coll. by ~~Mr Teixeira~~

check locality in book

ask Eiten if someone else

No ~~449907-0~~ 1962

prob. from Ennas



orthophyllous & sclerophyll.

Badly invaded by  
melinis, which forms  
a complete ground cover,  
up to 1 m. deep.

Soil a pinkish brown  
fine loamy sand.

Much dug up by  
armadillos.

Thick bark - sweet

On other side of road  
where there has been  
burning - grass is  
lower, perhaps 0.4 m.  
shrubs ~~of~~ lower,  
distribution more open,  
varying to nearly closed,  
varying to ~~for~~ open  
scrub forest, on this  
side of road mostly  
mesophyllous.

This is more typical  
as far as aspect is concerned,  
as this

Sao Paulo (under Pl. of Brazil)

Oct. 27 - near Pirassurunga  
roadside in red soil  
in cutover "campo cerrado".

43289 *Emilia javanica* (Burm. f.) Rob.

Forest near Cachoeira  
is a closed forest  
about 14-20 m tall  
with a few trees  
up to 4-5 dm dbh, which  
are emergent. Other 1-2 dm  
dbh 2-4 m. spaced,  
some small saplings  
between them. <sup>open</sup> shrub  
layer 1.5-2 m. tall  
very slight herb layer,  
mostly seedlings.  
Shrub layer mostly  
*Myrsine*.

Lianas common.  
Epiphytes not plentiful.  
Adjacent to this is  
an area where it has  
been cleared except  
a few scattered trees.  
Her cerrado plants  
have come in. Fuel  
because of grazing.  
Forest is grazed, too.

Forest is probably one  
that has been degraded  
but not cleared.

Mun. Pirassurunga

flowers red.



Oct. 27 - Emas, near  
Cachoeira, <sup>Mun.</sup> Mundo Pisassuaçu  
<sup>Campo</sup> in <sup>Cerrado</sup> campo cerrado vegetation,  
badly invaded by melinis.

43290 *Randia?*

4 occasional

6 91 (leg.) *Connarus fulvus* Planch.  
~~at~~ rare2 92 (comp.)  
occasional2 93 *Stylosanthes guianensis* (Aubl.) Sw.  
local3 94  
occasional1 95 *Tabebuia?* *Zeyheria digitalis* (Vell.) Hoehne <sup>det. A. Gentry 1974</sup>  
rare, one plant seen3 96 *Randia*  
occasional1 97  
rare1 98 (anlep.) *Blepharodon lineare* (Neene) det. Spellman 1978  
rare3 99 *Adiantum*  
common locally43300  
3 rare1 01  
rare1 02  
rare3 03 *Wedelia?*  
occasional1 04 *Aristida fallens*  
common locally on rather bare soil

open scrub or scrub forest

Piraicaba

shrub 1.5 m. tall, buds  
not open.shrub 1.5 m. tall,  
pods inflated.  
marginal flowers tubular,  
purple.  
erect~~shrub~~ shrub 1.5 m. tall,  
fruit fleshy, red.  
slender unbranched  
shrub, 1.5 m. tall.  
shrub 1 m. tall,  
flowers dull yellow.  
leafless shrub.erect, milky; flowers  
green, crowns white.  
rhizome buried, fronds  
erect.~~small~~ tree; flowers  
greenish.

shrub 1 m. tall;

fruits green.  
low shrub, fruit green.

flowers bright yellow

clumps



- 43305 *Spermacoce*  
occasional
- 2 06 *Gomphrena macrotheca* Mart.  
common in trails
- 4 07 (malp.)  
common  
~~occasional~~
- 3 08 *o*  
occasional
- 3 09 *Caryocar*  
occasional
- 3 10 *Smilax*  
occasional
- 1 11 (malp.)  
occasional
- 2 12 gesner.  
occasional
- 1 13 *Stevia*?  
rare
- 3 14 *Miconia albicans* (Sw.) Triana (det. Wurdack  
(1968))  
common
- 4 15 *Eugenia*  
common
- 3 16 *Eugenia*  
occasional
- 3 17 (Annoniaceae?)  
occasional
- 1 18 *Didymopanax*  
rare
- 2 19 *Erythroxylum tortuosum* Mart. det.  
Blowman 1983.  
occasional

erect, flowers white.

root enlarged; heads white

shrub 2 m. tall (others  
seen much taller) petals  
pink

small shrub

shrub 2 m. tall,  
just past flowering.

— twining in bushes,  
fruit very young.  
— semi-scandent shrub  
several m. long, fls. yellow.

— erect from buried  
tuber, flowers with  
calyx and corolla  
deep orange.

— erect, flowers dull

shrub 2 m. tall,  
— leaves deep green above.

shrub 1 m. tall,  
— flowers white.

— shrub 1.5 m. tall,  
— ~~fls~~ fruits immature.

— shrub 2 m. tall,  
— fruit immature  
— sparsely branched

— shrub 2.5 m. tall,  
— shrub, bark very thick,  
leaves glaucous



43320 *Styrax floribunda?*  
occasional

3 21

occasional

4 22

occasional

2 23 (figs.) *Distictella elongata* (Vahl) Urb. (s.l. to include  
*D. mansonii*) det. A. Gentry 1974  
rare

1 24 (quilt?)

occasional

3 25 *Eugenia*

occasional

3 26 *Aegiphila paraguayensis* Briq. det. H. N. Moldenke 1974  
occasional on roadside

5 27 *Acanthospermum*  
common on roadside yard

Oct. 28, 1 km. n.w. of <sup>of</sup> Campo Grande  
railway station, ~~Mun.~~ de Ribeirão Pires  
in open grassy bog

1 28 *Polygala rubraefolia* Chod. ex Grandon  
common in wetter ~~parts~~ areas

2 29 *Paepalanthus*? *Leiothrix stavesicens* (Bong.) Ruhl.  
common locally

2 30 *Paepalanthus planifolius* (Bong.) Körn det.  
common

→ *Paepalanthus planifolius* var. *villosus* Moldenke det. Moldenke Nov. 1974

4 31 *Paepalanthus* <sup>*Syngonanthus caulescens* (Poir.)  
Ruhl. det. H. N. Moldenke 1974</sup>  
occasional, on mineral soil bank

3 32 *Cladium*  
abundant, dominant locally

shrub 1.5 m. tall,  
bud only.

shrub 1.5 m. tall;  
fruit very immature.

shrub 2 m. tall,  
branches ascending  
rather strictly.

climber, flowers white.

tree 5 m. tall, branches  
fleshy.

shrub 2 m. tall,  
fruits immature.

depressed shrub; flowers  
whitish.

prostrate, spreading  
from central root crown,  
extensively branching,  
heads whitish.

Mun. de Ribeirão Pires

erect, flowers reddish purple  
rosette with wintergreen odor.

det. Moldenke Nov. '74

Moldenke Nov. '74

large rosette, with  
a stem some cm. long  
but mostly down in peat.  
large rosette, heads  
almost globose.

erect, not especially  
caespitose.



Oct. 28 - Cerrado near  
~~Graciosa~~ 7, ~~miles~~ Km, n. of  
 m. de ~~Capão~~ Grande  
 grazed bog in lawn  
 surrounded by low  
 hills.

Ground rather irregular,  
 cut up by traps  
 partly open, grassy  
 with patches of an  
 erect *Cladium*.

patches of small, very  
 springy *Cyathus* about  
 1 m. tall. *Blechnum* sp.  
 (one with red young growth,  
 one without) scattered  
 irregularly, as are  
*Calopogon* sp. &  
*Microseris* sp. (?)

small shrub thickets 1-3 m.  
 tall in low spots.

*Melastomaceae* common.  
 Wing stemmed *Baccharis*.  
 a beautiful distichous  
 leafed, scapose, indehiscent  
 plant with blue flowers.  
*Sphagnum* & *Drosera*  
 ab

Oct. 28 - Estação Biológica,  
 Serra do Moji, Paranapiacaba,  
 above Santos, n.w. São Paulo -  
 about 1 hour + drive from São Paulo  
 over dirt roads through the  
 low hills of the coastal  
 range. Much industry here.  
 A large marsh at  
 probably included in the water  
 reserve, so may be protected.  
 The hills become partially  
 wooded with a scrub ~~or~~  
 scrub forest, partly clear.  
 basins between are bogs.

from Paranapiacaba station,  
 on the railroad it is 15 min. + walk  
 up to the station (biológica), which  
 is on top of a hill surrounded  
 by a typical montane scrub-forest.  
 Santos is visible on a clear day  
 below. But clear days are said  
 to be few. The southeast trades  
 hit the escarpment and are  
 pushed up. The range here is  
 between 700 + 1000 m. + high,  
 and the rain at the station  
 is over 2500 mm. annually.  
 Cloudiness is frequent and  
 drizzly rain prevalent.

The entire reserve, of 740 acres,  
 is wooded. It is deeply dissected  
 into ridges and canyons, with  
 many streams. In several places  
 there is a divide between the  
 (to p. 74)



Oct. 28 - Serra do Moji,

1/2 to 1 km

W. ~~near~~ Paranapiacaba,  
above Santos, Mun. de Santo André  
in ~~a~~ montane rain-forest,

43333 Peperomia

1  
3 34 sub.

occasional on scrubby ridge

1 35 apoc

rare on scrubby ridge

36 Utricularia

common, on ground and in  
bromeliad rosettes on wet  
scrubby ridge

1 37 Sisyrinchium

in open trail on wet ridge

3 38 Hedysmum

occasional on wet scrubby ridge

1 39

rare on wet scrubby ridge

5 40 (myrt?)

rare on wet scrubby ridge

4 41 (melast.) Leandra collinal Wundack (paratype)

~~in scrub~~ on wet ridge, low forest,

1 42 Pteris

in open spot on wet ridge

3 43 (myrt?)

on wet scrubby ridge

2 44 Pleurostachys

very common in semi-open  
places and along trail on  
wet scrubby ridge

3 45 Selaginella

common on wet cut bank <sup>above trail</sup> in canyons760-840 m. "Alto de Serra" Pm. de  
Ribeirão Pires

not particularly fleshy

shrub 4 m. tall,

— fruit immature.

— twining liana,

— flower white.

— rhizome <sup>white</sup> fleshy, brittle,

decid. in moss; flowers

Vale to ~~be~~ bright lavenderwith yellow stripes on ridges of <sup>with canals</sup> lobes.

— bud yellow; fruit

— green; leaves distichous

— shrub 1.5 m. tall,

— aromatic when broken.

— shrub

small tree 5 m. tall;

— buds white

— shrub 2 m. tall, slender;

— flowers white.

~~erect~~ fertile fronds

— erect, sterile spreading.

— shrub 2 m. tall, <sup>dark</sup> green above, pale beneath.

— stems decumbent to

— ascending, leaves

conspicuously 3-ranked.

plants somewhat stiff



- 43346 *Hymenophyllum*  
abundant on leaning tree trunk
- 3 47 *Trichomanes rigidum* Sw. det. Sellinger  
very local on steep bank  
in canyon
- 1 48 *Cochlidium peruvianum* (Sw.) L.E. Bishop  
rare on mossy rocky bank  
in canyon
- 4 49 *Grammitis*  
common, abundant on  
tree trunks
- 1 50 *Asplenium monanthes* L. det. Sellinger  
occasional
- 1 51 *Asplenium polyphyllum* Bertol. det.  
rare on tree trunk
- 1 52 (melast.) *Salpinga margaritacea* (Nard.) Triana  
occasional on cut bank above  
trail in canyon
- 3 53 *Vaccinium*  
rare in undergrowth  
in deep canyon
- 4 54 (melast.) *Leandra quinque dentata* (DC.) Cogn. (det. Wurdack)  
rare in undergrowth in  
deep canyon
- 3 55 *Elaphoglossum*  
on bank along trail in canyon
- 5 56 *Trichomanes*  
abundant on tree trunk
- 2 57 *Hymenophyllum*  
common on tree trunks
- 3 58 *Hymenophyllum*  
on tree trunks *polyanthos* (Sw.) Sw.

1978

det. Sellinger 1978

fronds pendent.

1978

small sterile tree,  
4 m. tall

Sellinger, 1978

(det. Wurdack (1968))

leaves dark green above  
with 2 rows of white  
spots, purple beneath,  
scape erect.sprawling shrub  
2 m. tall, corolla white,  
5-angled.shrub 2 m. tall, flowers  
white; fruit immature.

erect

Wurdack  
(1968)

det. Sellinger 1978



4 43359 *Hymenophyllum polyanthos* (Sw.) Sw. det. Sellinger, 1978  
 1 on small tree trunk

1 60 *Hymenophyllum* cf. *polyanthos* (Sw.) Sw. det. Sellinger, 1978  
 1 on tree fern trunk

1 61 (lobel)  
 1 on scrubby slope

2 62 (gerani)  
 common on scrubby ridge

3 63 *Stevia*?  
 rare on scrubby ridge

1 64 *Scleria panicoides* Kunth det. Strong 1988  
 rare on scrubby ridge

3 65 *Byrsonima intermedia* Tuss.?  
 rare on scrubby slope

4 66 (legum.)  
 occasional on scrubby ridge

3 67  
 abundant on earth banks  
 in canyon

twining in bushes,  
 corolla compressed,  
 rose pink.  
 scrambler, leaves  
 fleshy, corolla bright orange,  
 strongly gibbous, calyx  
 alate.

twiner,

erect.

shrub, fruits immature

small tree 4 m. tall,  
 stamens white.



(from p. 67) Parana and Atlantic drainages.

On ridges the forest is low and scrubby, in places very dense, generally unistratified except for a thick ground cover of Bromeliads and ferns. This tending to be thinner away from trails. In some places where ridges are wider, or where there are flat areas, the vegetation becomes more scrubby and tends to be more open, with much *Pleurostachys*.

In the ravines the forest becomes much taller, up to 20-25 (or even 30) m. tall, with trees perhaps 4-5 dm dbh. canopy complete.

Epiphytes are plentiful, especially orchids and bromeliads, also *Hymenophyllum*, other ferns, mosses, etc.

more so in the deep ravine than on exposed ridges.

However, they are not or scarcely plentiful enough so that this could be designated mossy forest or cloud forest.

Trunks not swollen with masses of hepatics and mosses. Hanging mosses not abundant.

Certain Andean elements are notable in the flora - Weinmannia, Fuchsia, Hedysmum, Hilisia parasites.

Melastomaceae common but scarcely abundant. Rubiaceae surprisingly infrequent.

Some lianas - Smilax, apoc. with white fls., Steria (?), various aroids. Aroids and ferns with stems clinging close to tree trunks seem very frequent.

*Utricularia* cf. *humboldtiana*, somewhat common along edge of forest along trail on side above railroad - has rhizomes deep in moss and ferns or even in bromeliad tanks. Rhizome is white, fleshy, has root-like slender much branched branches that bear traps, tiny white ones.

The reserve is cross crossed by a network of graded trails, which on slopes have steps made by putting in small logs. Fleshy fungi are common on these.

The soil is a mixture of clay, silt, & very fine sand. It is pale yellowish to white, very thin on ridges, where rocks are exposed.



1962 Brazil

Oct. 29 - Rio de Janeiro

plants seen

*Hibiscus tiliaceus**Terminalia catappa* (common str. tree)*Rapanea oleacea**Agave sisalana* (variegated)*Ficus elastica**Ficus "grandurata"**Codiaeum variegatum**Cordyline fruticosa**Sivistonia chinensis**Xanthosoma violacea**Cyperus papyrus**Eichhornia crassipes**Arecastum romanoffianum* <sup>common str.</sup>*Peltophorum ferrugineum**Cocos nucifera**Bumelapue aureus**Phyllodendron bipinnatifidum**Nicotiana glauca**Setcreasea purpurea**Pandanus dubia?**P. tectorius?**Malvastrum**Sansevieria guineensis**Galinsoga parviflora**Eleusine indica**Caryota urens**Mangifera indica**Dracaena fragrans**Monstera deliciosa**Xanthosoma sagittifolium**Canna lily**Euphorbia pulcherrima**1. arecathaceae**Plumieria rubra**7. Humboldtia grandiflora**Pontederia cordata**Ficus microcarpa**Clitoria**Ipomoea fistulosa**Delonix regia**Ravenala madagascariensis**Cyperus rotundus**Phyllanthus amarus**Sacciolepis indica?**Mogoulia tomentosa* (Rox.) Oishi*Artocarpus altilis**Impatiens sulcata**Cynodon dactylon**Ischaemum wilkesianum**Humboldtia alata**Ficus pumila**Cassipouira stricta**Polyscias grisea**Artocarpus heterophyllus**Plumbago auriculata**Panicum mesianum**Pharbitis nil**Monarda charantia**Psidium guajava**Echinus* (amer.)*Wedelia trilobata**Sida rhombifolia**Sida acuta**Ipomoea carnea**Urena lobata**Mimosa pudica**Borreria verticillata*



Nov. 2 - Auto trip in  
Guanabara.

fourth coast - steep  
and rocky between  
broad beaches. granite  
slopes at base of  
cliffs covered by scrubby  
thickets. Steep slopes  
bare except for  
crevices & ledges which  
have herbaceous tufts.

In and around Quinta  
da Imposição Lenna & Azolla.  
(photo of Pedra da Gavea)

Around Gavea Golf Club  
steep wooded slopes -  
scattered white Cecropia.  
A few houses & even apt. house  
on these slopes, with streets  
climbing to them. The soil  
on the lower slopes red.

Cross saddle to Barra  
Tijucas

Large sand flat in  
restinga - mostly built  
up in lagoon and  
mangrove swamp, with  
restinga between parts of  
this. Forest in restinga  
largely Eugenia sp. curvica.  
Some Cecropia. Hibiscus tiliaceus  
shrubs - Cordia sp., Vernonia  
& small spiny palm & clump,  
leaves very spiny. Trunks also.

This palm is bitter - not eaten.  
Some guava, and a shrub  
with broad oval lvs. &  
hooked tendrils. Persea.

Low spots have black  
peaty sand, are dominated  
by Eugenia. Little undergrowth.  
Many mosquitoes.

Along margins of sand  
what appears to be a Blakelya  
in sand. Young lvs. reddish.  
lvs. erect.

Acrostichum aureum  
common in wetter places  
and in swamps.

Appears sp. (glaucescens)  
very common on sand.

Typha marshes, Bladina  
marshes common.

Recreio dos Bandeirantes

Tijucas Restinga  
broad sand flat,  
with very low dunes  
just back of beach.  
They rather blown out  
(photos), with a low  
irregular scrubby veg,  
where sand is fresh  
ordinary psammophytes.

Just back of beach a  
strip of scrub of Diplazium  
maritimum up to 1 m tall.  
(photos)



*Trumpetta bartramia*  
"archigo"

*Richardia*

"picao de praga"

*Lechurus trebintidifolius*?

*Eragrostis cilianis*

*Sporobolus capras*

*Euphorbia hirta*

*Remirea maritima*

*Stenotaphrum secundatum*

*Richardia brasiliensis*

*Nicholaena rosea*

*Canavalia rosea*

*Sporobolus virginicus*

*Erechtites valerianifolia*

*Agapanthus africanus*

*Caryota mitis*

*Cycas circinalis*

*Allamanda cath. v. serr.*

*Cassia fistula*

*Tibouchina semidecandra*

*Grevillea robusta*

*Cycas revoluta*

*Bidens pilosa*

*Emilia sonchifolia*

*Ruellia equi*

all  
just  
back  
of beach

East along this north  
shore - the belt of dunes  
narrower, but the belt  
of palm scrub spreads  
down onto the low sand flat  
back of the dune. On this  
flat a complex mosaic  
of sand and marsh  
vegetation. Then some  
lagons, lined with  
Cladium marsh perhaps  
30-5 m. w. Between this  
and the dune ridge on which  
is the road, palm scrub  
with scattered *Cereus*,  
*Aechmea*?, *Tournefortia*,  
*Eugenia*?, *Sapotaceae*,  
*Euphorbiaceae*.

photos

On the beach side of the  
road a belt of  
*Sporobolus virginicus*,  
with a little *Canavalia*,  
*Sporobolus* sp. <sup>a few</sup> scattered,  
*Dipterocarpus*.

Eastward along coast  
the low palm scrub tends  
to give way, bet. road & lagoon  
to a dense wind or spray  
sheared scrub 2-4 m. tall.

Inland on restinga  
behind lagoon is a  
*Pteridium* about 2 m. tall



very much like that  
at Adrospoudome, but ponds  
not at all indeterminate.

*Panicum maximum*  
common in open ground,  
with *Trichocereus*.

Some casuarinas of  
*stricta* (*requisetifolia*?)  
planted, called "punheira".  
Most of the restinga  
covered by a scrub of  
scrub forest 4-5 m. tall.  
Much *Albizia*, isopine  
palm + *Cecropia*.

Westward this gives  
way to a low broadleaf  
scrub with many genera  
of shrubs - *Euphorbiaceae*,  
*Compositae*, *Croton*, *Cuphea*,  
*Coccoloba*, *Vaccinium*, *Cereus*,  
*Daphnotherium*, *Malpighiaceae*  
etc. On white sand.

(photos)

Photos of meadows from beach.

Furnas da Figueira

photos of granite domes

Cassada do Alta do Boa Vista  
in Floresta de Figueira  
(Photos)

Surrounded by rather  
tall montane rain forest  
perhaps 20 m. +. very mixed,

trees with umbrella crown,  
many lianas.

Belvedere Dona Marta  
a high point in the middle  
of the horse shoe, with views  
in almost 4 directions of  
all parts of the city - fully  
as high as the Sugar Loaf.

Vegetation on sides of this  
a scrub of many composites  
*Melastome* etc.

Climb to Crivada is thru  
very viny montane  
rain forest on steep slope.  
A few tree ferns, *Chusquea*,  
*Cecropia*.

Top all in clouds.



Nov. 2 - Restinga

east of Barro de Tijuca

in low scrub vegetation on sand flat

43363

*Vaccinium*

5

very common

2

69

(marcap.)

rare

3

70

*Polypodium?*

occasional

2

71

*Cassia ramosa* Vogel

rare

2

72

*Croton*

occasional

4

73

r

common

2

74

(comp.)

occasional

1

75

*Declieuxia tenuiflora* (Willd. ex. L. & S.) Steyer.

rare on bare sand

3

76

*Diordia*

occasional on bare sand

2

77

(matp.) *Marsippos*rare on ~~bar~~

3

78

*Borreria*

common on sand

Nov. 2 - Restinga de Barro de Tijuca  
on <sup>low</sup> dune ridge of white quartz  
sand just back of beach

4

79

*Diplothemium maritimum*

acaulescent, leaves spreading  
forming a dense scrub  
belt just above beach

(under Pt. of Brazil)

shrub up to 1 m. tall.

- corolla deep red, ripe fruit black.

shrub 0.3 m. tall. pedicel

- and bracts red.  
rhizome buried, frond erect

low shrub, flowers

- orange, deeper with age  
slender shrub 1-1.5 m. tall.

shrub 0.7-1.0 m. tall,

- flowers white.

weak shrub or suffrutescent

- herb, flowers dull white.

plant purplish, flowers white.

many stems <sup>ascending</sup> from root

- crown, fls. pale lavender

low shrub; flowers very

- bright yellow

flowers white

acaulescent; leaves  
spreading glaucous  
beneath; inflorescence  
erect.



86

1962 Brazil

43380 *Clitoria* ~~*Centrosema*~~ *virginianum* (L.) Benth.  
occasional on loose sand

~~81 *Borreria*~~

4 81 *Borreria*  
common on loose sand

3 82 *Hydrocotyle*  
very common on open sand

2 83 *Boerhavia*  
rare on loose sand

~~84 *Emilia sonchifolia* ?~~

3 84 *Emilia sonchifolia* ?  
common on loose sand

same - on sand flats  
well away from beach

4 85 *Fimbristylis*  
common along edge of  
water in channel

2 86 *Paspalum distichum* L.  
common

1 87 *Eugenia cumini* ?  
dominant in forest on low  
~~sandy~~ damp sand.

3 88 *Richardia ~~scabra~~ brasiliensis*  
common

Nov. 2 - Gruta de Imprensa

on wet rocks just above sea

3 89 *Lemna*  
common

3 90 *Azolla*  
abundant on wet rocks

Guanabara  
Guanabara

Under  
1st of May

87

spreading, forming a  
loose mat, from root crown.  
flowers lavender  
leaves cinereous; flowers white.

rhizomes white, fleshy,  
buried; leaves stiff, plain,  
blades held vertically.  
stems spreading to  
ascending

caespitose, erect.

forming loose sod

tree 6 m. tall; flowers  
white.

prostrate, extensively  
spreading, flowers  
white.



Nov. 11 - corner Circumference  
Highway & Braddock Rd.

Rolling land with  
deciduous woods 20-30 m.  
tall, with a few large  
oaks - *Quercus coccinea*  
*Pinus strobus*.

A scattered tall shrub  
layer of *Ilex opaca*, *Cornus*

Locally some *Pinus virg.*

Several old roadways  
across.

Toward Braddock Rd,  
*Fagus* becomes larger,  
more abundant. oaks less  
present, except to west  
where are several patches.  
and a scattering of large  
*Pinus rigida*.

(not) pretty of.

*Rudbeckia laciniata* a

*Goodenia pubescens* a n

*Tipularia discolor* a n

*Lycopodium obscurum* l

Plants - *Pinus strobus* n

Trees - *Quercus rubra* n

*Pinus rigida* o

*Pinus strobus* c

*Fagus* c-a

*Quercus coccinea* o

*Quercus alba* c

*Quercus velutina* o

*Acer rubrum* (subl.) o

*Carya* sp. o

*Fraxinus americana* n

*Pinus virginiana* lc

*Quercus balata* o

Shrubs

*Ilex opaca* c

*Pinus* o

*Cornus florida* c

*Viburnum acerifolium* lc

*Juniperus virginiana* (subl.) o

*Viburnum* cf. *dentatum* var. corymb. n

Herbs & low shrubs

*Polystichum acrostichoides* la

*Mitchella repens* c

*Chimaphila umbellata* lc

*Chimaphila maculata* lc

*Lonicera japonica* lc

*Allium vineale* n

*Monotropa uniflora* n

*Vaccinium vacillans* n

*Rhysopodium complanatum* lc

*Pyrola rotundifolia* o

*Smilax glauca* o

*Viola* sp. n

*Galium circaeazans* n

*Monotropa hypopitys* n



Labels  
written

Nov. 11 - Circumferential Highway  
at Braddock Road  
in deciduous forest  
with *Ilex opaca* understory

43391

*Quercus rubra* L.  
rare

2

1 92 *Lycopodium obscurum*  
small colony

1 93 *Goodyera pubescens*  
rare

1 94 *Pyrola rotundifolia* v. *americana*  
local, under *Fagus* trees

1 95 *Mitchella repens* L.  
abundant

1 96 ~~*Tipularia discolor*~~ <sup>*aplectrum hyemale*</sup>  
rare

1 97 (ord) *aplectrum hyemale*  
rare

tall tree, leaves yellow  
at this season.

leaves more or less in  
one plane.

leaves gray-green, veins  
white.

creeping; fruit scarlet.

leaves purple beneath.

leaves bronze-purple,  
veins white.



Nov. 24 - Sleepy Hollow  
 Tripps Run above Sleepy  
 Hollow Road bridge.  
 Bottom land forest -

- a Liriodendron
- a Quercus alba
- o Quercus palustris
- o Quercus ~~prunus~~ coccinea
- ^ Quercus bicolor
- o Acer rubra

Shrub layer 1 - 4 m. tall,  
 irregular

- c Prunus serotina
- c Fraxinus americana
- l Rosa multiflora
- lc Ligustrum vulgare
- lc Corylus cf. cornuta
- c Lindera benzoin
- o Viburnum prunifolium
- o V. dentatum
- o la Cypripedium caroliniana

tangled up to about 4 m.  
 with Lonicera japonica  
 similar Vitis sp.  
 some Rhus toxicodendron on  
 tree trunks.

Ground covered locally  
 by Lonicera japonica  
 locally by Glehnia  
 some Aster cf. lateriflorus,

Canopy irregular  
 but mostly complete

Cinna arundinacea,  
 Elymus sp.  
 Panicum cf. clandestinum

Upstream the forested bottom  
 broadens out.

One tree with bark coming  
 off in round flakes unidentified.  
 Small patch of Pinus  
 virginiana on slightly  
 higher ground to left.

This adjoins private property  
 at back of lots. Has many  
 paths - at least 2 pines  
 cut down.

Considerable Lonicera japonica  
 tangled up to 5 m.

Above this, toward stream,  
 Acer rubrum becomes abundant.

Then there is a transverse  
 strip where the forest  
 has been cut some time  
 ago, probably for a band  
 of the Tripps Run sewer.



This has some open grass, some *Alnus* scrub, some bush of *Prunus serotina* saplings 3-5 m tall.

The ground is marshy.

*Carex* spp.

*Lilichium*

*Arthraxon hispidum*

*Aster* ssp.

*Solidago* spp.

Above this is a flat of some width covered by a forest of

*Acer rubrum*

*Diospyros virginiana*

*Quercus palustris*

*Liriodendron*

Mostly rather small - up to 2 dm dbh, occasional much larger trees.

*Lonicera* much more local here, in places the forest is quite open.

*Viburnum dentatum* forms clumps.

Much of this area is swampy, some with hummocks of fern roots, etc.

This swampy land has

o *Vaccinium corymbosum*

c *Lindera benzoin*

o *Sambucus canadensis*

o *Fraxinus* spp.

o *Alnus serrulata*

*Smilax rotundifolia*

a *Cinna arundinacea*

This swampy area is drained by a small stream with dendritic branching system.

Across the more open part of this flat, just downstream from the stream draining the swamp, ~~is~~ a ditch was apparently dug, sometime back, which drains the part of the flat toward the houses to the southwest.

This apparently keeps the adjacent ground less swampy than it would be otherwise. This



has much *Allium vineale*, locally, and *Glechoma hederacea* on the ground.

Here the *Viburnum dentatum* is most abundant.

*Cinna arundinacea* is common. Some *Rindera*.

Southeast of this in woods with little undergrowth *Cinna arundinacea* is very abundant, *Agrimonia* common.

Near Tripps run considerable evidence of small boy - chopped fallen trees, paths, etc. Digging on sandy stream terrace.

*Lonicera* abundant near Tripps Run.

At lower end of the open strip is a swampy area, but a ditch has been dug draining this into Tripps Run.

About halfway to Sleepy Hollow Road a small channel pond has been partly drained by a ditch rather recently dug.

One *Quercus bicolor* tree perhaps ~~15~~ 15 m. from Tripps Run - only one seen. The leaves from it are very conspicuous on ground (heavy wind last night).

These ~~are~~ scattered to Tripps run, about ~~15~~ 15 m. in s.e. direction away from Run, about ~~30~~ 30 m. up stream, perhaps 40 m down stream. Perhaps some measure of influence of one rather small tree - perhaps 15+ m. tall, 20 cm dbh. Much overtopped by surrounding trees.

another ditch has been cut to ~~the~~ Tripps Run just back of lot facing Sleepy Hollow Rd.



Nov. 30 - Stone House, just west  
of Bull Run, near Manassas  
Battlefield Park

Photos of *Platanus occidentalis*  
along small stream in pasture,  
with *Juniperus*, etc.

Nov. 30 - Wildcat Mt. Preserve

birds - blue jay  
crow vultures

(Mr. Arundell saw grouse  
this morning and 20 wild turkeys  
yesterday)

*C. chinensis* vulgaris still in flower.  
*Chrysanthemum leucanthemum*  
*Symphoricarpos orbiculatus* in fruit  
*Achillea millefolium*

Winter rosettes

*Oenothera biennis*  
*Chrysanthemum leucanthemum*  
*Achillea millefolium*  
*Antennaria plantaginifolia*  
*Panicum* sp.  
*Plantago lanceolata*  
*Fragaria virginiana*  
*Verbascum thapsus*  
*Barbarea vulgaris*

Evergreen ferns

*Asplenium platyneuron*  
*Polystichum acrostichoides*  
*Polypodium vulgare*  
*Woodsia obtusa*  
~~*Barbarea*~~



Dec. 3 - Baltimore Parkway  
Just before College Park Exit  
photos of *Pinus virginiana*  
forest

2.5 mi. before Beltsville Exit  
photos of mixed deciduous  
woods with *Acer rubrum*,  
*Liquidambar*, oaks, *tilia*, etc.  
1/2 mi. before Beltsville exit  
photos of stream-bottom  
land forest.

Just beyond first Laurel-Bowie  
exit, photos of *Betula nigra*  
thicket.

Dec. 9 - near Pocomoke State  
Forest - Winston farm

Harvested soy bean fields  
abundant deer tracks.

Deciduous second growth  
largely *Liquidambar* up  
to 15 m dbh about 2 m.  
spacing 15-20 m. tall,  
much similar.

*Erodium cicutarium*  
abundant in plowed field  
Brownish grey fine sandy  
loam soil.

Along edge of field  
is a single row of *Pinus*  
*taeda*, then deciduous  
forest. At end of row is  
a patch of *Pinus taeda*

Birds

White throat

Ruffed grouse

*Myrica caripera* (?) abundant  
at edge of forest under trees,  
less common back in  
second growth.

Similar very abundant  
in undergrowth, much of  
it bitten off at 2-4 dm.

*Magnolia virginiana* & *Ilex*  
*opaca* common in undergrowth.  
This is very thin second  
growth with much  
*Quercus alba*, scattered  
*Pinus taeda* (small), *Quercus*  
*falcata*, *Q. muhlenbergii*,  
a little *Fagus grandifolia*  
abundant *Gaultheria* on  
ground. Some *Myrica*  
This has been logged not  
too long ago.

Low ground along small stream



has *Sphagnum*  
 Most of *Thalassia* is in  
 the low areas. These low  
 spots common, even  
 away from stream.  
*Asmundia repens*.

*Nex opaca* abundant,  
 forming an understory  
 up to 6-8 m. tall.  
 The trees in swamp  
 areas have characteristically  
 swollen bases. Small  
*Taxodium* common locally  
 in swamps. Some *Quercus*  
*prinus*.

Large area of shrub  
 swamp, with *Alnus*, *Myrica*,  
*Rosa palustris*, *Amorpha canescens*,  
*Vaccinium corymbosum*: with small *Liquidambar*, *Taxodium* scattered.  
 Quite a few *Taxodium*  
 about 25 m. tall, 3 dm dbh  
 with enlarged pitted bases  
 abundant knees around  
 edge of this.

Considerable open water  
 with sedges, *Rudwigia*

Adjacent is rather  
 more wooded swamp,  
 with *Acacia rubra*, *Liquidambar*  
 to 25 ~~cm~~ m. 15 m dbh  
 some *Taxodium*, almost



dense understory of *Nex*  
 about 3-5 m. tall among  
*Liquidambar* and *Acacia* and  
 scattered *Pinus taeda*. *Myrica*, *Rhododendron*.











low *Sphagnum*  
 Most of *Magnolia* is in  
 the low areas. These low  
 spots common, even  
 away from stream.  
*Asmundia regalis*.

*Ner opaca* abundant,  
 forming an understory  
 up to 6-8 m. tall.

The trees in swamp  
 areas have characteristically  
 swollen bases. Small  
*Taxodium* common locally  
 in swamps. Some *Quercus*  
*prinus*.

Large area of shrub  
 swamp, with *Alnus*, *Myrica*,  
*Rosa palustris*, *Chamaecyparis*,  
 with small *Liquidambar* *Taxodium* scattered.

*Vaccinium*  
*crispulum*:

Quite a few *Taxodium*  
 about 25 m. tall, 3 dm dbh  
 with enlarged fluted bases,  
 abundant knees around  
 edge of this.

Considerable open water  
 with sedge, *Ludwigia*

Adjacent is rather  
 more wooded swamp,  
 with *Acer rubrum*, *Liquidambar*  
 to 25 ~~cm~~ m, 15 m dbh  
 some *Taxodium*, almost

no undergrowth,  
 broad flat hummocks  
 with dry grass and  
 mosses, occasional small  
 knuckle thickets

many trees have been  
 blown down, leaving  
 thin dense root platform  
 standing on edge.

Water flows through  
 broad shallow pools and  
 shallow channels between  
 hummocks and root

platforms. Cuscuta have  
 a braided appearance (photo)  
 Deer tracks abundant along  
 some of these channels.

Channels marked by  
 black wet leaves against  
 tawny dead leaves and  
 grass of hummocks.

Canopy here is almost  
 complete, but perhaps  
 thin. Spacing from  
 3 to 5 m. *Ner opaca*  
 occasional in this  
 swamp but only tiny  
 saplings 0.5 m. tall or  
 less.

On surrounding slightly  
 higher ground there is a  
 dense understory of *Ner*  
 about 3-5 m. tall among  
*Liquidambar* and *Acer* and  
 scattered *Pinus taeda*. *Morus*, *Rhododendron*.



Toward the fields  
(p. 100) this becomes less  
and less hummocky,  
the wet ground covered  
by thin grass.

A broad flat levee,  
perhaps an old roadbed  
cuts straight across  
this. ~~the levee cuts~~

On slipper and top of  
levee much tangled  
humulus. Levee inter-  
rupted by a deep black  
elongated pool 6-8 m  
across, connecting  
the swamp on both sides.

55 or 60 acres for sale,  
belonging to William B. Denton  
Box 184 Rt #2, Know Hill, Md.  
(Ph. Princess Anne 734-W2)

A few acres of it are in cultivation.  
A few acres are fairly good  
loblolly pine. part of the ref.  
on the higher parts, is logged  
over, the larger trees removed.

The larger part is swamp  
which has no very large  
trees, but shows no signs  
of recent logging. The swamp  
probably occupies at least  
half the acreage. He wants  
\$10,000 for everything but the house.

Most of the land  
that is above the water table  
has considerable *Smilax*  
*rotundifolia* in the under-  
growth. ~~The~~ *Ilex opaca*  
is dominant understory  
tree.



106

1962 Maryland

Rebel  
written

43398

2

Dec. 9 - west of Snow Hill,  
just outside Potomac State Forest  
*Lycopodium obscurum*  
common very locally in  
*Pinus taeda* forest on low  
sandy soil.

Worcester Co.

107

spreading by underground  
rhizomes.



Dec. 15 - about 7 miles north of Culpepper on rt. and between there and Culpepper are excellent examples of fence-rows of *Juniperus virginiana* in all stages of development from a few tiny seedlings to dense rows 70 ft. tall.

*Juniperus* shows a tendency to invade fields where they are not cultivated, esp. where they are dominated by *Andropogon*. Hence they are found in pastures and not in cultivated fields. The prominence in fence rows may be due to a combination of the fact that seeds are dropped here by birds sitting on the fences and the fact that they are not eliminated so effectively from fence rows by cultivation.

Jan. 1 Sleepy Hollow,  
S. of Falls Church  
Fruits (empty heads) of *Liquidambar* have fallen in some quantity on the snow. Considerable wind last night. Many still on trees.

Jan. 6 Sleepy Hollow.  
Many *Liquidambar* fruits still on trees.  
(3 photos).



Jan. '73 - Head of South River,  
Bet. Tarnan Br. and Rt. 50  
Intersection of Tarnan Br.  
North River, Bacon Ridge Br.  
to form South River.

Lower Tarnan Br. lined  
with marsh.

High land about 15 m.  
bluffs to marsh abrupt  
wooded, some trees tipped.  
High ground with some  
growth hardwood, a  
few Pinus rigida, P. virginiana  
Large Liquidambar.  
Oaks, small beech  
scattered small Ilex opaca.  
A few large beech. Some  
Myrica. A few Kalmia.  
Rhododendron and Gaylussacia  
abundant. Patches of Kalmia.  
On Liquidambar perhaps  
1.5 m dbh. Good Kalmia  
on ravine banks.

Several large ravines  
perpendicular to Branch.  
Forest becomes much  
better in area cut by  
ravines. No Liriodendron here.  
Many trees 3-6 dm dbh.  
On N. side of large  
ravine large area of  
Kalmia, none on other  
side. On top of  
ridge patches of

pine, dwarfed hardwood  
surrounded by tall hardwood.  
230 acres

### Joy Neck

Miss Nancy Murray  
died. Will leaves life  
interest to Adelaide Calhoun  
to go to an eleemosynary institution  
for a wildlife sanctuary  
at her death. Cory.  
Equitable Trust as executor.  
Jarva 360-400 acres  
was left to Smithsonian  
+\$11,000 without strings.  
1 property prob. worth 25,000 +.

Jarva has areas of  
really fine old forest  
such as along the road  
in and on the point at  
end of road.

Other patches in various  
stages of succession. Some  
marsh.



Jan. 20 - Forêt de Fontainebleau  
in ~~this~~ open scrub forest  
of *Betula alba* with  
Calluna shrub layer on sandstone

- 43399 *Calluna vulgaris*  
dominant in shrub layer  
400 *Erica cinerea*  
occasional  
401 moss *Rhacomitrium lanuginosum*  
common on rocks  
402 *Betula alba* var.  
dominant  
403 *Betula alba* var.  
dominant

A considerable area on  
the sandstone terrace  
normally covered by *Pinus*  
*sylvestris*, has a  
pure stand of *Betula* in the  
tree layer, 4-6 m. tall. ~~or~~  
1-3 m. apart, so young  
that no trace of black  
roughness ~~at~~ has  
appeared at base, a  
shrubby layer 0.5-1 m. tall  
of *Calluna*, with much  
bare rock with mosses.  
Ice coats the rocks and  
small pools are frozen  
solid.

In places *Pteridium*  
replaces the *Calluna*.

shrub 0.7 m. tall.

dwarf shrub 2-3 dm. tall

small tree 5 m. tall with  
white bark, dark  
scars.

small tree 6 m. tall  
with white bark, dark scars.

In the pine forest around  
this is much bracken.  
Larger *Betulas* here mostly  
show black furrows  
at base.

In the deciduous forest  
some is pure *Fagus*,  
some *Fagus* and *Quercus*.  
Some areas have a  
conspicuous tall  
shrubby layer of *Ilex*  
*aquifolia*.

A large highway  
is cutting a terrible  
swath through this  
forest. The forestry dept. is  
said to have made a deal giving  
this up and buying forest in west of France.



Jan. 25 - Road from Fontainebleau to Orléans  
 over almost the whole distance  
 the trees are white with ice (or  
 very solid and thick frost), and  
 ground has thin powdery snow,  
 but no ice on highway.  
 The ice is not thick enough  
 to break branches from trees.

Orléans to London solid fog -  
 top level, with patterns  
 on top, including a great  
 arcuate sharp line convex  
 north. Over England widely  
 scattered curious little  
 knobs or bumps protruding  
 from top of fog layer. Open  
 patches showing snowy  
 countryside, escarpments, etc.  
 near

At London Airport same  
 appearance of frost on  
 trees - examined closely  
 is a tufted fan of dendritic  
 branched soft frost crystals  
 each serie, forming a cylinder  
 3-8 mm. long, 1-2 mm. thick  
 very closely and intricately  
 branched, perhaps anastomosing  
 perpendicular to wings and  
 branching perpendicular.



116

117







901819 -  
902075 -  
901633

Theodore Barbley  
U. of Kansas - int. in pt. bl. veg.

Dimitri Lucie Benjamin  
B.T. gard. Rio.  
Rubiaceae

Find out if warming  
Laguna Santa has ever  
been translated into English  
or Latin.

Barro de Tiquis

## Raven's Hollow



Warrenton, Virginia

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# Raven's Hollow



Warrenton, Virginia





**P**ROVIDING an opportunity to return to our outdoor heritage is the purpose of Raven's Hollow near Warrenton, Virginia. Raven's Hollow, one hour from Washington, is a place where a man and his son can rediscover the pleasures of the outdoors.

Raven's Hollow is dedicated to conservation, physical fitness, wildlife and to the relationship between father and son.

It is a place for those who are dedicated to maintaining a refuge for thought and participation in the pleasures of the outdoors can gather.

Raven's Hollow was formed by persons who are vitally interested in the exchange of ideas and in the conservation of our American Heritage. It is a meeting place for those having these interests and those who have dedicated personal resources to the advancement of the Airlie Foundation.





### **Facilities**

- Hunting in a six hundred acre game preserve
- Skeet
- Golf
- Riding
- Hiking
- Tennis
- Lake swimming, fishing and boating
- Overnight accommodations
- Excellent Food
- A rustic shooting lodge
- Films
- Lectures

### **Location**

Raven's Hollow is located on Airlie Farm, four miles west of Warrenton, Virginia.

### **Information**

For information write Raven's Hollow, Warrenton, Virginia or Call Warrenton 347-1300, area Code 703.

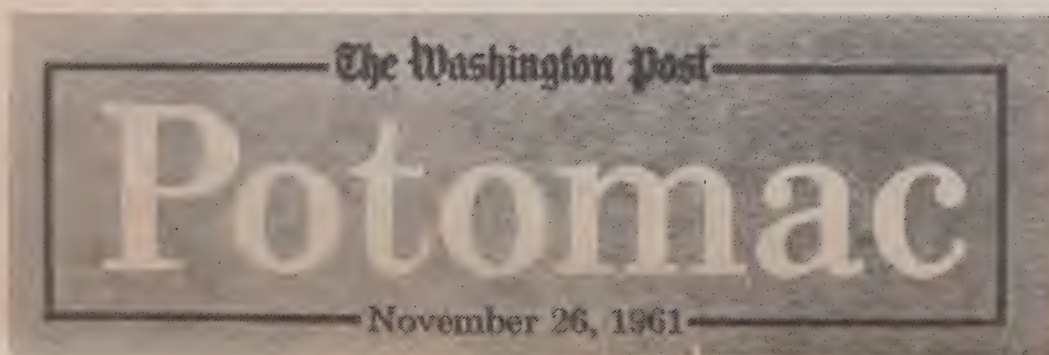




# Warrenton Estate Becomes a Think Center

## *For The Thinking Man*

AIRLIE House, the big, graceful think center near Warrenton, Va., has a serene pace that won't appeal to the average convention-goer. Nevertheless, its popularity is increasing, perhaps proving as its founders believe, that shops, bars, theaters and other convention city attractions have a serious competitor in tranquility.



*Lester Van Atta, Hughes Research; Albert E. Burke, TV news analyst; and Maurice Albertson, Colorado State U.*



## Luxury Of Thought Is Airlie House Necessity

Above, two delegates to a Strategy for Peace Conference at Airlie House meditate during a morning stroll.

# Serenity and Service for Thought

THE NATION'S CAPITAL, with its high concentrations of brain power, now has its own Think House, centered in a mountain-locked island of rural retreat outside Warrenton, Va.

There, isolated in 1200 acres of rolling pastureland, is a new conference center designed to provide the atmosphere for clear thinking. It is called Airlie House, itself the brainchild of the Nation's only dentist-physician-lawyer, Dr. Murdock Head.

Modeled in purpose after New York's famed Arden House, it is no plush, rococo retreat. The facility is an assembly of Georgian manor houses, lodges and guest accommodations, redesigned to modern comforts, such as air conditioning and wall-to-wall carpeting. It is a working conference center away from the distractions of busy offices or ordinary convention assemblies.

At Airlie House someday, some of the world's thorniest problems may be challenged for the "best interests of the public"—the founding phrase which sets it above and apart from swank, commercially operated resort hotels.

It has its horse country recreations—riding, hunting, fishing, hiking, tennis and skeet shooting. But primarily its chief attractions are solitude, service and serenity for thinking men and women concerned with the public's problems.

Here big wheels and little cogs can be brought together. Participants talk, and listen to each other, and ponder. They agree and they disagree, and they carry their impressions, their sometimes changed and sometimes reinforced ideas back home with them. It's something like oldtime town meetings, or discussions around the pot-bellied stove in the country store, revived and modernized.

Such isolation and total submergence in the subject matter can spell the difference between an effective conference and an ineffective junket.

Airlie House, named for a Scottish Lord, is operated by Airlie Foundation, a nonprofit organization chartered by the Commonwealth of Virginia. Its proximity to Washington makes it readily available to Congress, government agencies, research and educational centers and industry without the problems of excessive expense or travel time loss.

Its rates vary with the type of conference, the number of participants, and the services required. In general, they have ranged from \$20 to \$25 a day for each participant, a charge comparable to convention headquarters hotels in major metropolitan areas of the United States.

One recent conference at Airlie House attracted more than 100 leaders of industry, education, armed forces and the government. This was the third annual Strategy for Peace Conference, whose previous conclaves were at Arden House.

The conferees discussed such things as the interrelationships of military strategy, technology and

arms control; disarmament and military stockpile inspections and control; the economic aspects of disarmament; changing emphases in the United Nations, and the economic and social development of emerging nations. Previously, Airlie House had accommodated sessions of the American Religious Heritage Society.

Conference subjects may be as broad as the world has problems. Any group with a serious problem of public interest to discuss is eligible to stage a gathering at Airlie House.

The organizations which sponsor conferences there pay the costs. Some pass these costs on to the participants; some bear part of the costs out of their treasuries. The founders of Airlie House are seeking funds to sponsor or help sponsor worthy conferences which may never otherwise be held for lack of leadership and funds.

The food is good, and ample, and usually served cafeteria or buffet style. Millionaires may be used to higher luxuries and services than can be made available at present charges, but unless such demands become important, the facility will continue on its present course, says Dr. Head.

Dr. Head is the three-letter man of the professions. He earned a dental degree, and when he found that barred him from certain surgeries, he entered medical school and won his M.D. Then he found that dentists and physicians needed legal help, so he studied law and won a degree in that profession.

Now chairman of the Institute of Forensic Medicine at George Washington University, he is content that his brainchild, Airlie House, is here to stay. The money he and his influential friends raised to set it up and get it going, he said, is a good investment for the Nation.

He's going to develop other interests, like medical research in the special clinic on the Airlie Farms estates, and television programming and the making of documentary films.

By Nate Haseltine  
Staff Reporter

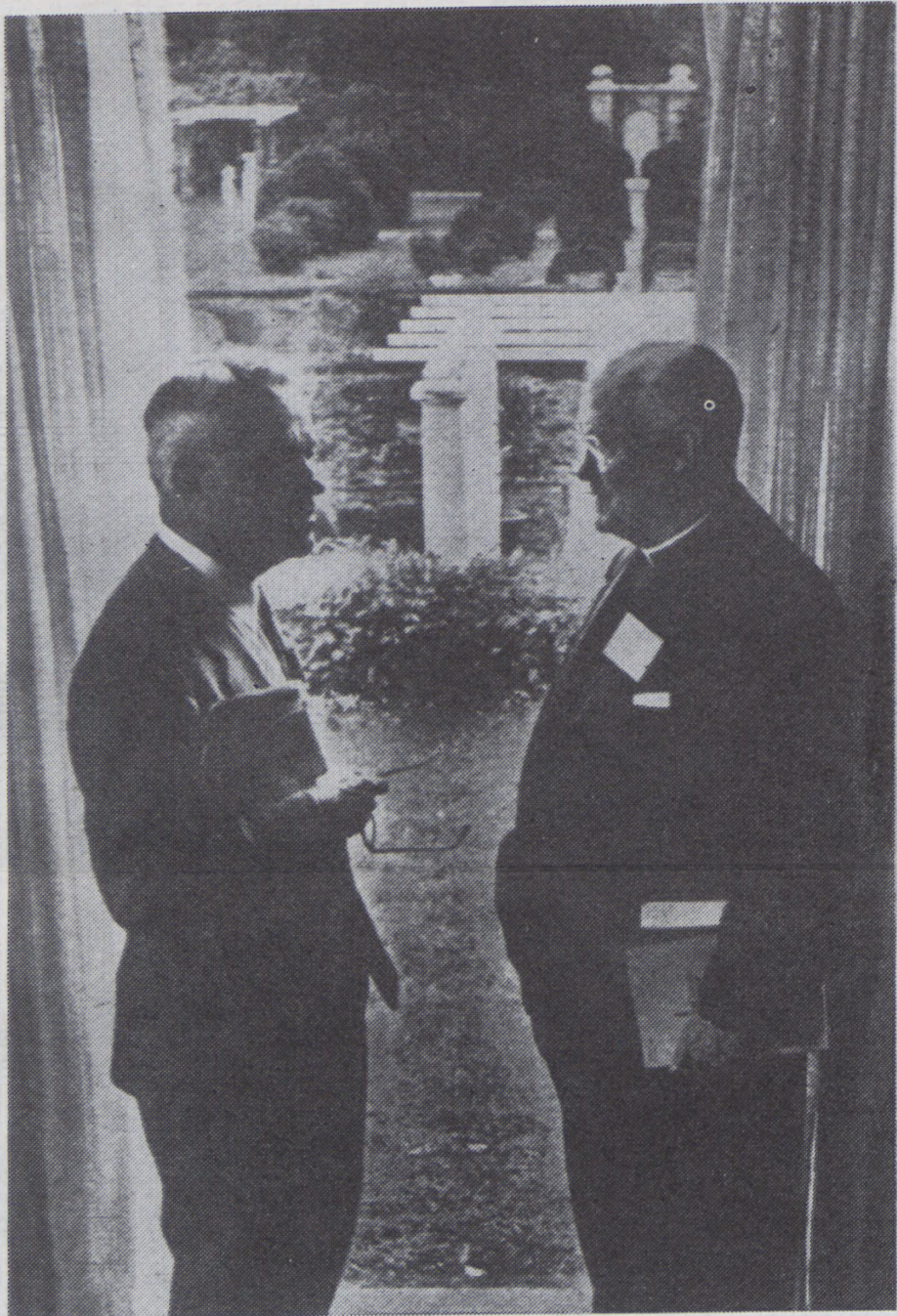


Airlie House stenographers, secretaries put the spoken words into printed forms.



dining hall at Airlie House. Meals are simple but adequate, generally served buffet style to the delegates.





*Gen. J. Lawton Collins (USA, ret.) and the Rev. E. A. Conway, Director, Creighton University Center for Peace Research, discuss important point.*



*Arthur N. Holcombe, Chairman, Commission to Study the Organization of Peace, reads a report.*



*The possibility of producing a documentary film series at Airlie House is the topic of debate by TV lecturer Albert Burke and Dr. Murdock Head.*



*Accommodations at Airlie House range from a 65-man dormitory to more luxurious surroundings such as this room being shown to Mrs. John Marvin by John Bordelon, administrator of Airlie House foundation.*



# Planners Laud Kennedy Stand On Open Spaces

By William Chapman  
Staff Reporter

President Kennedy's official recognition of the need for preserving open spaces in the Washington area could not have come at a more opportune moment in the view of suburban planners in Maryland and Virginia.

It came at a time when comprehensive plans for saving large wedges of farms and woodlands are being presented publicly in the growing suburban counties on both sides of the Potomac.

In a statement Tuesday supporting the corridor concept of developing the National Capital area, the President declared:

"It shall be the policy of the executive branch to seek to preserve for the benefit of the National Capital Region strategic open spaces, including existing park, woodland and scenic resources."

These open spaces are essential to the corridor development plan because they would separate the extended zones of high-density development planned to stretch out through the suburban countryside.

The goal of keeping these spaces free of cluttered, hazardous development poses the biggest problem for the corridor plan itself.

But on both sides of the Potomac, planners believe that President Kennedy's endorsement will aid materially.

"Thank heavens he came out when he did," said Fairfax County Master Planner Rosser H. Payne. "It was just luck, of course, but it is certainly timely. It will give us a terrific boost."

Fairfax planners Wednesday released their version of a corridor plan applied to local conditions and next week will release a program for preserving open spaces.

In suburban Maryland, the President's statement is expected to add emphasis to a proposed general plan incorporating the corridor concept. Public hearings on it will be held in January.

Planners in Fairfax and on the Maryland-National Capital Park and Planning Commission are offering similar methods to keep the open spaces open.

Their programs include purchasing of parklands, zoning for low-density development, tax policies which encourage farming and the acquisition of easements. Here is what they foresee in each category:

**Purchase** — With enormous areas involved, outright purchase of open spaces can do only a small part of the job. This is particularly true now when the traditional source of parkland money, the Capper-Cramton Act, has dried up.

With a 2.1-million-dollar assist from the Urban Renewal Administration, suburban Maryland is forging ahead on 45 different purchases ranging from large tracts in the Upper Rock Creek watershed to several regional parks in Prince Georges. It is hoped that 4000 acres can be ac-

quired under the present program and that more Federal money will be made available next year.

Fairfax County will be asked to buy up 27,000 acres in a long-range program, starting with the remainder of a 4-million-dollar bond issue.

**Zoning**—By limiting development to scattered large lots through zoning laws, the counties can hold off non-conforming development for some time. Montgomery County has rejected five-acre zoning as too extreme but it has made two-acre zoning stick in many up-country areas. The Prince Georges maximum now is one-half acre lots, but new zoning categories will be proposed next year.

Fairfax County's two-acre zones were overruled in the courts, but only because they were indiscriminately applied to nearly two-thirds of the County. The new open spaces plan will propose two-acre restrictions according to a carefully designed over-all concept.

**Taxes**—To help farmers who want to resist the pressure of fast-rising land values, Maryland's preferential tax law offers low assessments on agricultural properties. Changes will be proposed in the General Assembly to prevent speculators and land developers from taking advantage of the tax privilege.

Fairfax County planners will suggest a similar law with built-in protection against speculators.

**Easements** — The Virginia and Maryland planners will encourage the purchase of conservation and scenic easements of strategically-placed open spaces. The land-owner will be paid for keeping his property undeveloped as long as the easements are in force. In effect, the public buys a stake in the land for the difference between what the owner could sell his land for with and without the restrictive easement.

In all three suburban counties, the planners want to move fast because several presently planned developments would conflict seriously with the corridor plan.

In Prince Georges, DISC, Inc., is seeking zoning for a 2500-acre tract in the Largo area where planners envisage a wide expanse of open spaces.

In western Fairfax County, former Supervisor George Landrith has applied for rezoning of 200 acres far from the corridor leading to Centreville. Planners expect development pressures, all up and down the 30-square-mile Pohick Watershed, now labeled for open space.



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Theodore Barbley

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Dimitri Lucie Benjamin

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Find out if warmings  
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Barro de Tiquero



